WOOD WORKING digest

JULY 1951

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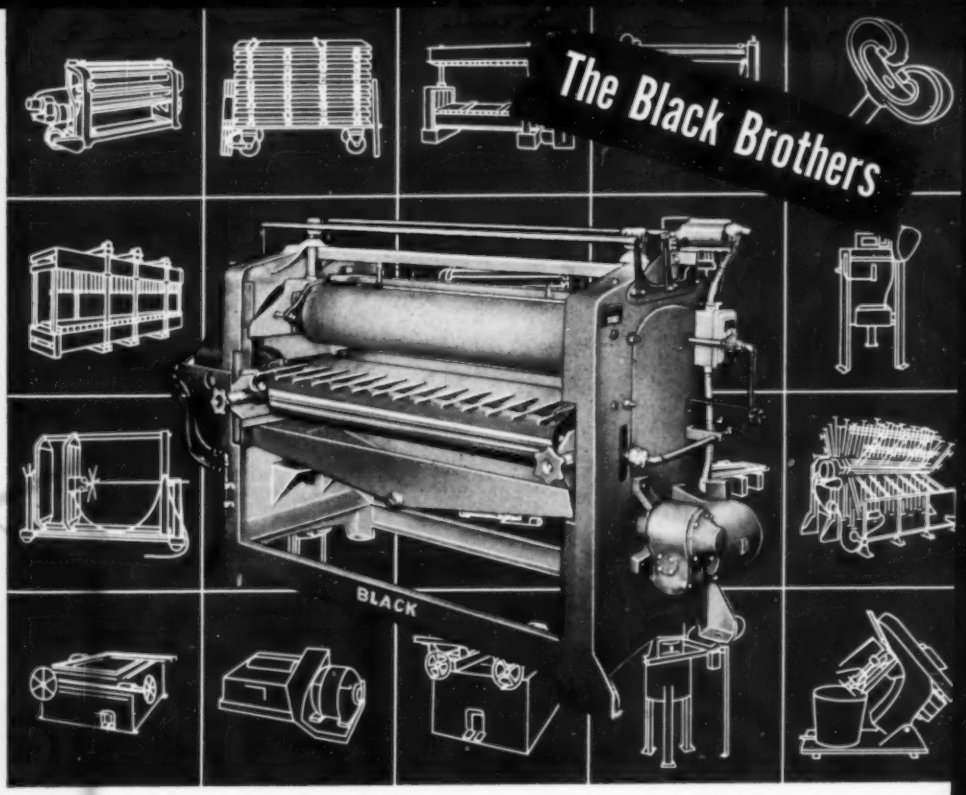
A HITCHCOCK
PUBLICATION



A Complete Line of Laminating & Gluing Equipmen

Black Brothers manufacture a complete line of laminating and gluing equipment of nationally recognized superiority. Illustrated above is a No. 22-D resilient roll, ball bearing glue spreader equipped with water cooled doctor rolls as an optional extra for use with quick setting glues. Gluing rolls are deeply covered with fine synthetic rubber, and are specially grooved to control the amount of resins deposited and to conform to irregularities in the veneer. Accurate, heavy duty ball bearings are sealed to keep lubricants in, and dirt and glue out. Black's 22-D Spreader for resins, casein, and other cold glues is unmatched in speed, economy, accuracy, cleanliness and quality production. Write for details today . . . or let us send you a catalog on the complete Black line.

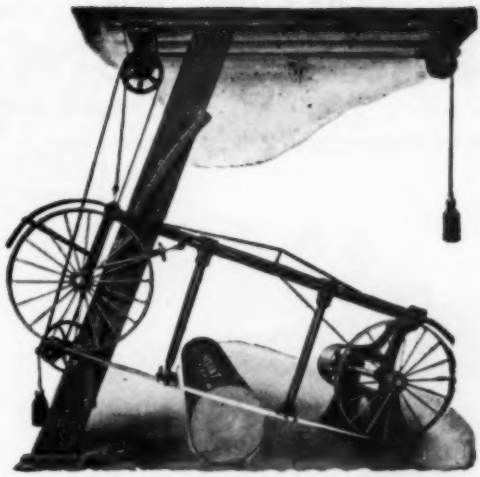
"If It is Gluing Equipment—We Have It"

THE BLACK BROTHERS CO., Inc.

Mendota, Illinois

"Oliver"
No. 316 BAND CUT-OFF SAW
for logs and timbers

Replaces Two Drag Saws . . . and



saves 6 cutting hours per day!

Profit from the advice given by one owner of this Cut-Off Saw to a prospective buyer: "We bought one of these Saws seven years ago. Formerly we ran two drag saws to cut logs to length, and kept those two drag saws busy 10 hours a day. Since installing this 'Oliver' Saw we do our cutting by running this Saw four hours a day. Upkeep is practically nothing."

The "Oliver" Band Cut-Off saw cuts logs, timbers, etc. in short lengths for shingles, staves, veneer stock—in fact, any cross-cutting formerly done on other types of saws.

"Oliver" Band Cut-Off Saws are built in three sizes. The largest cuts 60-inch logs. They are speedier, use less power and give years of profitable service. "Oliver" makes many other machine tools for better woodworking.

Get all the facts... write for Bulletin No. 316

OLIVER

OLIVER MACHINERY COMPANY

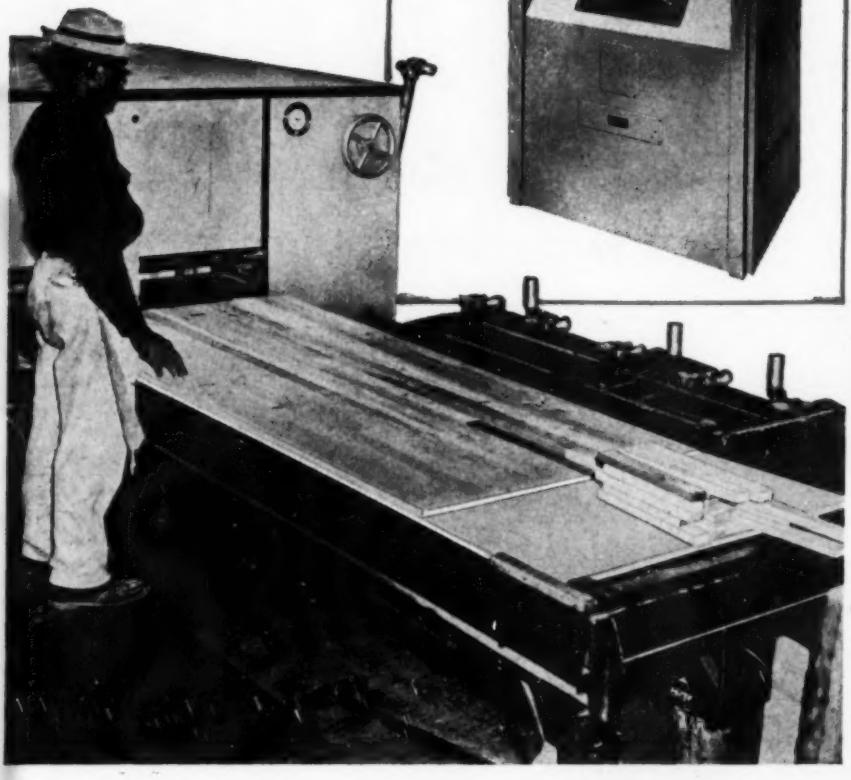
Established 1890

GRAND RAPIDS 2, MICHIGAN

YOU CAN BE SURE...IF IT'S

Westinghouse

New
10 KW-6.8/13.6
MC dual frequency
generator designed
for wood gluing.



A Westinghouse 10KW-5 MC generator and a Weldon-Flinchbaugh panel press produce phenomenal savings in costs and materials at Bradley Plywood Co.

Part-Time SAVINGS

$26,000

A YEAR!

RF gluing equipment is used in new, efficient and productive ways by Bradley Plywood Company, Savannah, Georgia. For one day a week Bradley's RF equipment glues scrap wood salvaged by them to make lumber core panels, desk-top cores and other items.

On scrap-wood gluing alone, Bradley saves $26,000 a year!

Bradley spends the other four days a week on RF gluing of core-stock panels from standard size lumber. With RF heating, production has tripled, costs have been halved.

For full-time operation, the $26,000 scrap-wood savings plus an annual saving of more than $36,000 in normal operations paid for the installation in less than three months. There have been added benefits: fewer rejects, less glue, less planing, less floor area.

Today, scarcities demand savings. For savings information, call your Westinghouse representative. Or write Westinghouse Electric Corporation, Department W-3, 2519 Wilkens Avenue, Baltimore 3, Maryland; ask for the booklet B3946B covering *"RF Heating for the Woodworking Industry."*

BEACH SWING CUT-OFF SAW

$395.00 F.O.B. FACTORY

TABLE $195.00 EXTRA

WRITE FOR FREE FOLDER

Beach Swing Cut-Off Saw shown above is popular Model #605 furnished with built-in 5 horsepower electric motor. Also available with 3, 7½ and 10 horsepower motors. All machines are self-contained units of Steel construction. Swinging arm is mounted on ball bearings and has vertical adjustment of 2".

BEACH

MANUFACTURING CO. • MONTROSE, PA.

Wood Working Digest

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Wapakoneta Knives

ASSURE HIGH SPEED PRODUCTION

BIG CHIEF

The most dependable knife for general purpose high production work.

KNIFE SPECIALISTS SINCE 1891

MOHAWK

Can withstand hard knots in Southern and similar soft woods.

THE **WAPAKONETA**
MACHINE COMPANY
WAPAKONETA, OHIO

There *is* something new under the sun!

Important events cast a long shadow before them. The newest conveyor to be perfected by our engineers . . . Walters Moulder Stock Return . . . had barely joined our "line-up" when exciting reports on its efficiency, adaptability, and all-round "money-savingness" began to pour in. We'll be glad to let you in on the secret of its success. The coupon below will bring you full particulars. Inquire today!

BE PROFIT-WISE . . . CONVEYORIZE

WALTERS MFG. CO.

MORRISTOWN, TENNESSEE

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934 East Main St., Morristown, Tenn.

☐ Please send me complete information on the Walters Moulder-Stock Return

☐ I am also interested in Walters complete line of conveying equipment and services.

Name _____ Firm _____

Address _____ Tel. _____

City _____ State _____

LET'S FACE IT . . .
GREEN LUMBER PRODUCTS JUST WON'T SELL!

● With today's net profit on most unit sales at an all time low, every woodworking operator knows it's more necessary than ever to increase production and eliminate waste and green lumber rejects.

Protect YOUR Profits! Rely on Standard dry kiln internal fan construction and automatic reversible cross-recirculation for faster, more uniform drying under exact conditions throughout every kiln load. *Rely on Standard to cut operating costs!* Whether you need a single unit, a full battery of kilns, or need to remodel your old natural draft installations for maximum profit-building results, get the facts . . . *YOU'LL* want Standard too!

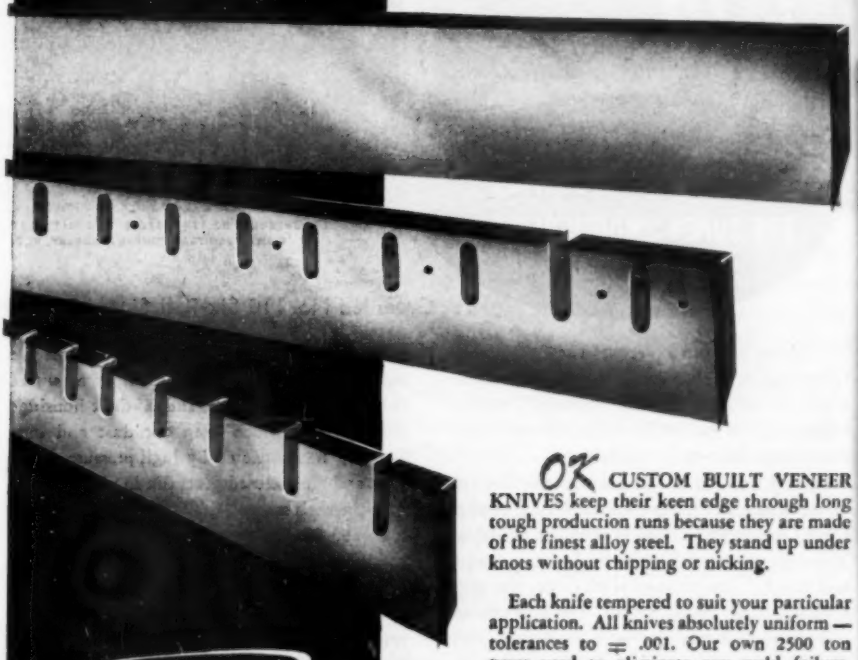
Manufacturers of Internal Fan Kilns

Write for illustrated Standard Catalog

STANDARD
Engineers and Manufacturers Since 1907
DRY KILN COMPANY

P. O. BOX 5708 • INDIANAPOLIS, INDIANA

you GO with OHIO GREEN



OK CUSTOM BUILT VENEER KNIVES keep their keen edge through long tough production runs because they are made of the finest alloy steel. They stand up under knots without chipping or nicking.

Each knife tempered to suit your particular application. All knives absolutely uniform — tolerances to ± .001. Our own 2500 ton press used to eliminate any weld failure. They do your job — faster — safer — more economically.

OHIO KNIFE Co.
CINCINNATI 23, OHIO
WORLD'S LARGEST EXCLUSIVE MANUFACTURERS OF KNIVES

GREENLEE NO. 110 PLANERS IN OPERATION AT WHITE FURNITURE COMPANY, MEBANE, N. C.

SMOOTH IN OPERATION FOR SUPER-SMOOTH RESULTS

. . . Greenlee No. 110 Six-Roll Single Planer

The minute you run a piece of stock through a GREENLEE No. 110, you'll see what we mean when we talk about "smoothness". Finely finished panels can be planed so smoothly that they require little or no sanding.

Yet the No. 110 is a production machine for all types of planing. Feed speeds for rough cuts as well as for finely finished work are available. The entire operation is performed with such ease and speed . . . the finished work comes out with such fine finish and accuracy . . . you'll be able to picture immediately the extra production this GREENLEE equipment can bring to your plant.

Friction, wear, and power consumption are reduced to an absolute minimum by means of ball and roller bearings, and oil-tight housings for the gears, which keep out dust and dirt. Bearings are lubricated by high-pressure grease gun, and the enclosed gears run in oil and lubricate themselves.

In all, the GREENLEE No. 110 Planer brings to all kinds of work . . . whether box boards or finely finished panels . . . unusual production speed, ease of operation, and accurate, smooth results. Write today for details. Greenlee Bros. & Co., 1867 Twentieth Ave., Rockford, Illinois.

MACHINERY & TOOLS

GREENLEE

GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING and BORING TOOLS

WHAT *Casie* CAN'T DO, *Resie* CAN!

Any practical glue man will tell you that *not all glues are the same* . . . that there are jobs where "NCC" casein glues will give best results . . . that other jobs require one of National Casein's resin glues.

That's why we remind you that a job "Casie" can't do, we believe "Resie" can—and vice versa.

Ask the National Casein man who calls on you for his recommendations. He is a Glue Man on whom you can rely for the right glue for your job.

Your inquiry incurs no obligation. Whether for tank car, tank truck or drum, National Casein has a delivery plan for you.

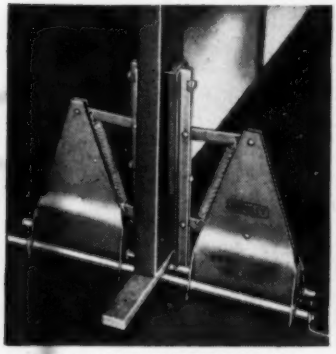
National Casein

No Glue Problem—Casein or Resin—is too Little, too Big, or too Tough!

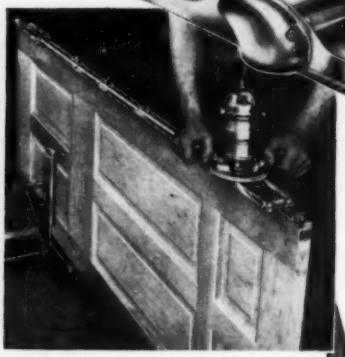
605-19 West 80th Street, Chicago 20, Illinois • Broad & Fulton Sts., Riverton, New Jersey

Get Production Line Efficiency

ELECTRIC PLANE, J38. Completely new! Does quick, flawless trimming and fitting of doors. Ingenious design blows chips entirely free of cutter. Planes widths to 1¾".



DOOR AND SASH HOLDER GA-156 solves problem of holding doors firmly upright. Eliminates makeshift sawhorse set-ups. Cushioned clamps protect work . . . release automatically.



DOOR AND JAMB TEMPLETS T5 or T6 make hinge mortise positioning accurate and fast . . . can be duplicated on as many doors as desired. For either 2 or 3 hinges.

. . . in door fitting, hinge mortising

These important steps in the final stages of door manufacture are a speedy, "1, 2, 3" operation with the help of this team of Stanley Electric Tools. Work flows smoothly from one step to the other in minimum time. Result is lower production cost, and neater, more accurate work — more acceptable to builders. For full details on these Stanley tools, see your dealer, or write for catalog. Stanley Electric Tools, 433 Myrtle Street, New Britain, Connecticut.

HINGE BUTT ROUTER H88A mortises 6 times faster than by hand. Leaves smooth, flat surface . . . perfect fit for Stanley Round Corner Hinges.

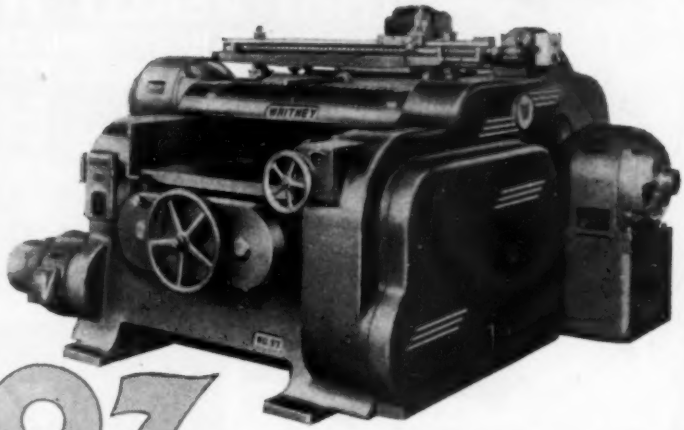
STANLEY

Reg. U.S. Pat. Off.

HARDWARE • TOOLS

ELECTRIC TOOLS • STEEL STRAPPING • STEEL

There's nothing like it for fine production planing....



97 WHITNEY DOUBLE SURFACER

CAPACITY

30", 36", 40" and 44" widths
Planes stock 1/16" to 7" thick
Feeds, 30 to 90 feet per minute

FEATURES

- **Micro-feed Selector — any feed at touch of handwheel**
- **Variable Speed Drive — an infinite number of feeds — with brake motor**
- **Direct-reading feed indicator**
- **Power raising and lowering of bed**
- **Power-feed, self-reversing Knife Grinder**
- **Convenient Controls**
- **Safe operation**

Long on performance, short on upkeep expense, that's the record of the Whitney No. 97 Double Surfacer — the last word in fine production planing. Whitney precision construction and careful workmanship and Whitney's long experience building quality planers has made the No. 97 the outstanding double surfacer in the field.

You can't beat today's rising costs with equipment that is short of the best. The Whitney No. 97 will pay for itself in increased production, quality planing, less waste and substantial savings in your sanding and finishing operations. Write for full information. Ask for Bulletin D7.

Planer Specialists for more than 100 years.

BAXTER D. WHITNEY & SON, Inc.

PLANERS • SHAPERS • VARIETY SAWS • MORTISERS • BACK KNIFE LATHES

WINCHENDON, MASSACHUSETTS, U. S. A.

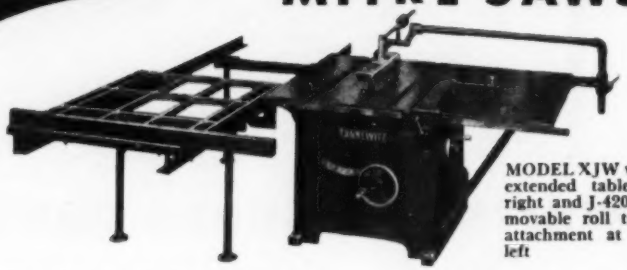
Like Shoes THAT REALLY FIT!

—PROVIDING COMFORT AND EXTRA MILES OF EASY PROGRESS

Tannewitz

TYPE "XJ"

MITRE SAWS



MODEL XJW with extended table at right and J-420 removable roll table attachment at the left

With their alternate top combinations, provide that perfect fit of machine to mitering requirements that results in greater ease of operation, greater accuracy and greatly increased production.

Five table-top combinations to choose from . . . doing away with awkward, inconvenient, make-shift set-ups . . . the ideal for working large or extra-large panels, or run-of-the-shop material. Whatever your requirements may be, there's an "XJ" combination that will fit them to a "T" — all at moderate cost. Write for complete details. It's the greatest buy in mitre saws on the market.

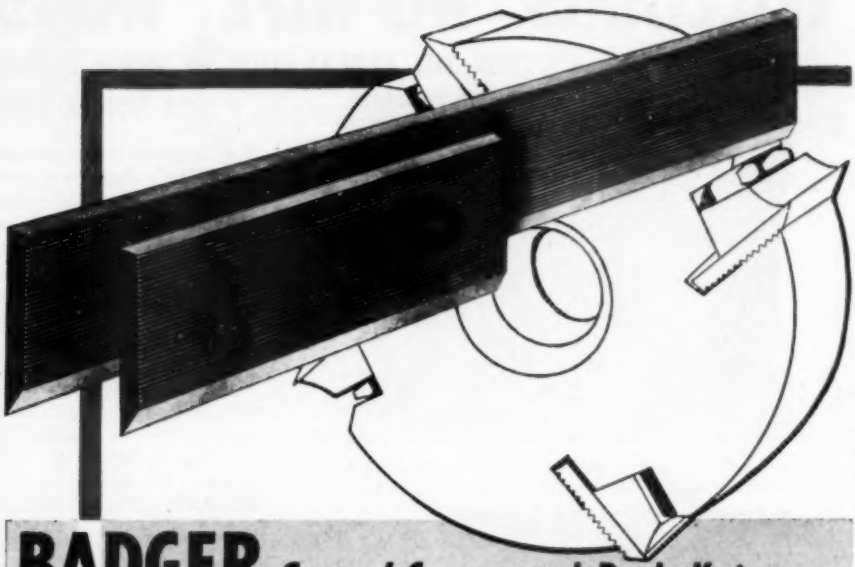
MODEL XJ: Has standard size solid table
MODEL XJS: same as XJ but with sliding left section top

MODEL XJSW: Same as above but with J-430 extended sliding table at left

MODEL XJSW: Sliding left section top and extended table at right

SAWING MACHINERY SPECIALISTS

The TANNEWITZ WORKS GRAND RAPIDS, MICHIGAN



BADGER *Ground* Corrugated-Back Knives

"Service-Proved" by Years of Heavy-Duty Performance

Wisconsin — pioneer producer of Corrugated-Back Knives — can point to a service record of many years standing, a record based on the satisfactory experience of millwork plants . . . furniture factories . . . custom planing mills . . . and other users of heavy-duty knives. As satisfied customers, they continue to specify BADGER Corrugated-Back Knives for these *Service-Proved* features:

- **SHARP, CLEAN CORRUGATIONS** . . . ground by a special process . . . assure an extra margin of safety and security.
- **FINEST HIGH SPEED STEEL** . . . scientifically heat treated and tempered . . . to insure uniform hardness and *edge-retention* toughness.
- **DIMENSIONAL UNIFORMITY** . . . through precision grinding methods . . . cuts jointing costs, assures even wear, prolongs service life.

Available in 24" Bars, or Cut to Specified Lengths.

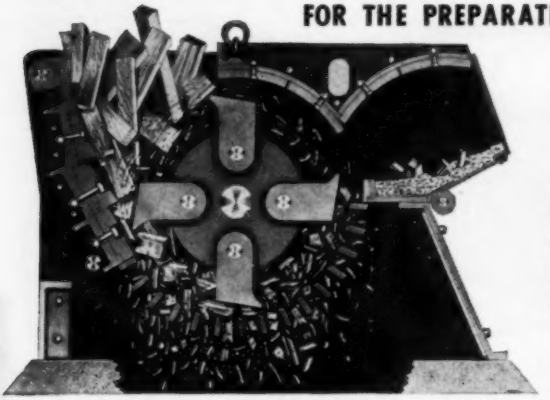
CUTTER HEADS BADGER KNIVES

Engineers to the Woodworking Industry

BELOIT, WISCONSIN

WILLIAMS "NO-NIFE" HOGS

FOR THE PREPARATION OF WOOD REFUSE FOR BOILER FUEL



Sectional drawing of Williams "No-Nife" Hog showing how the fast revolving hammers cut the wood refuse by impact.

Williams new and improved "No-Nife" Hogs are now offered for use in all wood working plants. Experience has proven, that when properly handled, wood refuse is the cheapest fuel for all wood working plants. Therefore, the wood refuse utilized in this manner not only insures a proper fuel supply, but also provides a convenient and economical method of cleaning the refuse from the mill and disposing of it without additional expense.

Hog fuel as made with the improved "No-Nife" Hog.

ALSO USED FOR REDUCING WET OR DRY VENEER AND PLYWOOD SCRAP

The Williams "No-Nife" Hog will reduce wet or dry Veneer and Plywood Scrap to a uniform size wth no long slivers or big pieces—thus the finished product can easily be handled in pneumatic air lines. No need to worry about elbows of your system becoming clogged. Hundreds of satisfied users attest to their dependability.

WC81-2

CHECK ✓ THESE FEATURES

- Many sizes of "No-Nife" Hogs to choose from.
- Adjustments to overcome wear.
- Larger feed opening.
- Hinged cover—instant accessibility.
- No knives to sharpen or be damaged by tramp iron.

WILLIAMS ALSO MAKES...

Hogs and Shredders for making wood flour and sawdust. Vibrating Screens and Air Separators to work in closed circuit with our Shredders for absolute control of product size.

Williams Patent Crusher & Pulverizer Co.

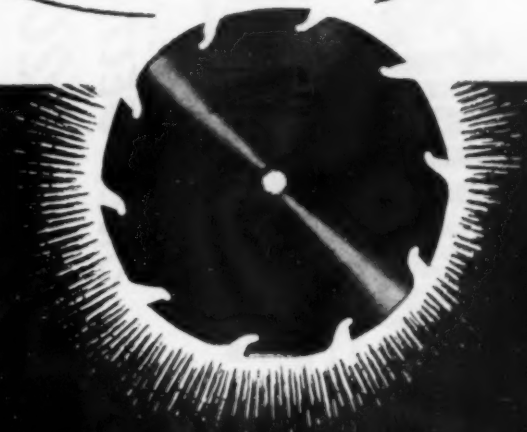
808 St. Louis Ave. • St. Louis 6, Mo.

WILLIAMS

CRUSHERS GRINDERS SHREDDERS

NO SECRET

WHY THIS SAW IS SO POPULAR, EFFICIENT, AND FAST CUTTING



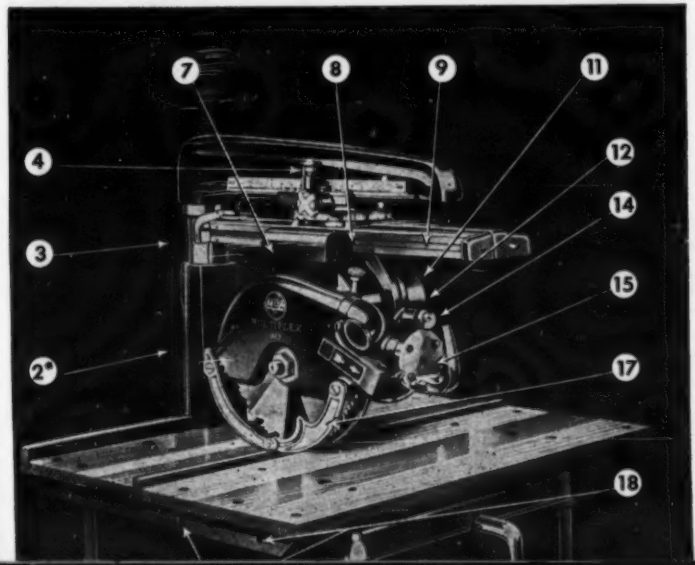
The New

- ★ SAFE
- ★ NO KICK BACK
- ★ LESS POWER REQUIRED
- ★ EASILY RE SHARPENED
- ★ RIPS CROSS CUTS MITERS

At any one of our 1,100 dealers in U.S.A. or write, wire, phone.

THE F. HEINEMANN SAW & MANUFACTURING COMPANY
CANTON 6, OHIO—U. S. A.

COMPARE the new Delta 40-B WITH ANY OTHER RADIAL SAW



ONLY DELTA HAS ALL THESE 20 FEATURES WITHOUT EXTRA COST

Now, with no added cost to you, Delta gives you a new radial arm saw with the 20 basic features users want most—the saw that users have wanted for over 25 years.

Together, these features mean added safety . . . wider range of uses . . . faster set-ups . . . easier operation . . . space-saving compactness . . . low upkeep, long life.

Compare before you buy—you'll be glad you did!

20 PERFECT RADIAL SAW FEATURES

		New Delta 3 HP DD*	Saw B Solid Arm 3 HP DD*		Saw C Sliding Arm 3 HP DD*	
1	Capacity: Cut-off 16" x 1" and Rip to Center 48" Panel	Yes √	Yes	√	Yes	√
2	Locks, Levers, Scales, Controls up Front	Yes √	No		No	
3	Inter-locking Safety Plug Disconnects Power Line	Yes √	†		†	
4	Quick-Set Miter Stops 30°—45°—60°	Yes √	Only 45°		Only 45°	
5	Range Full Miter Capacity 0 to 90° RIGHT	Yes √	No		No	
6	Range Full Miter Capacity 0 to 90° LEFT	Yes √	No		No	
7	Grease Shielded Ball Bearing Carriage	Yes √	Yes	√	Yes	√
8	Track Wipers Keep Trackways Clean	Yes √	No		Yes	√
9	Adjustable Nitralloy Lifetime Trackways	Yes √	No		No	
10	Saw-arm Swings Full 360° Above Work Table	Yes √	No		No	
11	Motor has "Built-in" 115 to 230 Voltage Changer	Yes √	Yes	√	Yes	√
12	Voltage Relay Start, 1 Phase Totally Enclosed Motor	Yes √	Yes	√	No	
13	Motor Tilts 360° Inside Yoke	Yes √	No		Yes	√
14	Quick-Set Bevel Stops 30°—45°—60°—90°	Yes √	Only 45—90°		Only 45—90°	
15	Finger-Tip "Start-Stop" Motor Switch	Yes √	No		Yes	√
16	Full Cut-off Capacity at Any Angle 0 to 90°	Yes √	No		No	
17	Safety Guard Fully Encloses Saw Blade	Yes √	†		†	
18	Means Provided to Attach Extension Tables	Yes √	Yes	√	Yes	√
19	Column Elevating Handle at Front	Yes √	†		Yes	√
20	Big 9 cu. ft. Tool Storage Cabinet Base	Yes √	†		†	
		20 Yes	5 Yes		8 Yes	

*DD—Direct Drive Motor †Optional at extra cost

ASK TO SEE THE FAMOUS DELTA 360° MITER TEST

Saw Brand "B" with solid arm design has only *five* of these features without extra cost.

Saw Brand "C" with sliding arm design has only *eight* of these features without extra cost.

Delta 40-B has *all 20* features at *no* extra cost.

Use the coupon for free literature on Delta radial arm saws, including cost comparison data.

DELTA POWER TOOL DIVISION
MIL[illegible]KEE
Rockwell
MANUFACTURING COMPANY
661 G E. VIENNA AVENUE • MILWAUKEE 1, WIS.

Please send me Delta Radial Arm Saw literature.

Name_____

Address_____

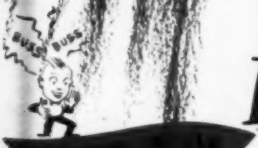
City_____ Zone____ State_____

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 MACHINES—246 VARIETIES—MORE THAN 1300 ACCESSORIES

THE BUSS 4-L



STOCK TWISTS IN MACHINE

Pressure bar, lower rolls or upper outfeed rolls may be cocked; or uneven tension on latter. BUSS instantaneous micro-controls practically eliminate this trouble. Write for further details.

IN NO other planer in the medium-size, lower-price range can you get INSTANTANEOUS CONTROL OF LOWER ROLLS, INSTANTANEOUS MICROMETER CONTROL OF PRESSURE BAR, the SHEARING BAR, VARIABLE SPEED and the many other BUSS exclusive features that save time in set-up and changeover, provide maximum production and finest quality finish planing. If your production requirements are within the capacity of the 4-L (24", 26" or 30" x 8") a simple comparison will quickly convince you it is the finest, most advantageous planer you could possibly buy. Write for Bulletin 54 for complete details.

The BUSS line contains a type and size for every production set-up. Singles: — Small, Medium and Large; Double Surfacers and the No. 55 for surfacing rough lumber. Write for bulletins or consultation on any planing problems.

234 EIGHTH ST. **HOLLAND, MICHIGAN**

NOW! *a phenol-modified adhesive*

that equals a straight resorcinol adhesive

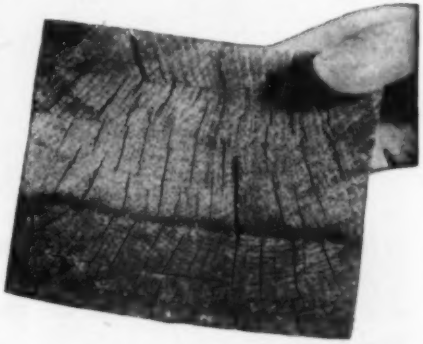
. . . COSTS 25% LESS!

PENACOLITE® ADHESIVE G-1260

● Now . . . just in time to alleviate the critical shortage of resorcinol due to extraordinary demands for defense needs, the originators of Penacolite resorcinol resin adhesives have developed a new phenol-modified adhesive. It is comparable to straight resorcinol adhesives . . . and costs ¼ less! This is Penacolite Adhesive G-1260, a two-component resorcinol-phenol formadehyde resin adhesive capable of curing at room temperature and providing strong, waterproof bonds. The use of this modified formulation means a saving of nearly half the scarce resorcinol that would otherwise be required—an important consideration in view of NPA's restriction on resorcinol.

Penacolite G-1260 bonds will not deteriorate with age. And they're unaffected by molds, fungi, grease, most organic solvents and acids. The durability of this economical adhesive has been *proved* through gruelling Vacuum-Pressure Cycle Tests under Specification JAN-A-397.

Penacolite Adhesive G-1260 will provide strong bonds between wood, treated woods, many plastics, natural and most synthetic rubbers, primed metals, and porous materials such as paper, leather, textiles, plaster, cement, fiberboard, and asbestos boards. For defense work, call the Koppers Chemical Division office nearest you and arrange for a supply of this durable, money-saving adhesive. And remember: our technical service is always at your call.



This photo shows a block of Penacolite-bonded, laminated wood after it was subjected to the 21-day Vacuum-Pressure Cycle Test. The *wood* checked . . . but the *Penacolite joints* held!

KOPPERS COMPANY, INC.
Chemical Division, Dept. WWD-7
Koppers Building, Pittsburgh 19, Pa.

KOPPERS **PENACOLITE RESORCINOL ADHESIVES**

FULL-AUTOMATIC YET *LOW* IN PRICE!

HANCHETT

DN KNIFE GRINDER

SMOOTHER - MORE FLEXIBLE CONTROL FINER FINISHES
with the new Electrically-controlled Table Drive

HIGH-PRECISION CUTTING EDGES and LONGER-LASTING BLADES
from new permanently-aligned Knife Bar

A MASSIVE MACHINE made in sizes up to 108" work piece capacity.

Write for complete data "WW-71".

COVEL SAW SHARPENERS HANCHETT KNIFE GRINDERS

HANCHETT MANUFACTURING CO.

World's Largest Manufacturers of Saw Sharpening and Knife Grinding Machinery

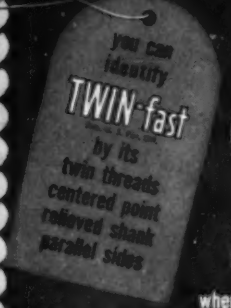
Main Office—Big Rapids, Michigan **West Coast—Portland, Oregon**

The Double Thread Cuts the Time in Half!

Can be furnished with either Slotted or Phillips recessed head

Save assembly time . . . . . get better fastenings with the TWIN-fast Screw's four exclusive advantages

1. Twin thread doubles the pitch . . . drives the screw twice as far for each turn of the driver.
2. Centered point helps make fast, straight start—no wobbling of screw, no displacement of parts.
3. Relieved shank eliminates "wedge action" and splitting—makes stronger fastening.
4. Parallel sides (no taper except at point) gives greater contact—often allows fewer or smaller screws.

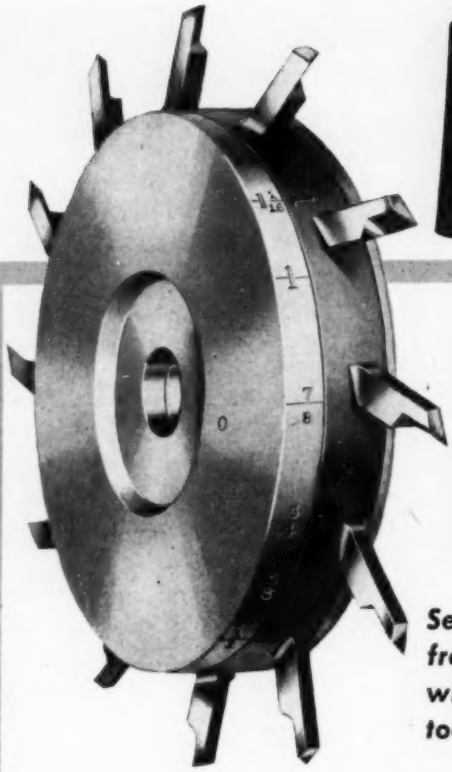


save TIME
save DRILLING
save SCREWS
save REJECTS

when assembling wood to wood, plastic to wood or metal to wood

TWIN-fast

The Faster Driving . . . Cost Cutting Fastener



NEW

9 inch *Quick Set* DADO!

Set any width Dado from 1/4 to 1-1/16 inch without removing tool from arbor!

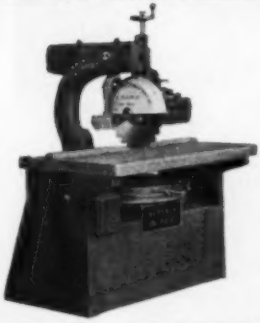
A twist of the dial and it's set for any width dado. Cuts up to 1 inch deep. Standard widths indexed for convenience. Twelve "Silvanite" High Speed Tool Steel blades slice through hardest wood without vibration, chatter, burning or chewing. Makes the smoothest cut you ever saw—even in plywood! Cutting edges stay sharp 4 to 5 times longer than conventional dados.

The Quick Set Dado is perfectly balanced and self-cooling. Blades are silver brazed in interlocking steel and aluminum plates. It's bored for a 1 inch shaft and can be used on large table and radial saws. Adaptable for right or left hand rotation. 3/4 and 5/8 inch bushings also available. Complete price $40.00. Worth twice as much in time and temper saved. See your dealer or write:

CONSOLIDATED MACHINERY & SUPPLY CO., Ltd.

2031 Santa Fe Avenue ★ Los Angeles 21, California

MONARCH MACHINES
Designed for Profitable-Production!



MONARCH UNI-POINT RADIAL SAW
MODEL X36-AF

Revolutionary in performance, speed, accuracy and safety. Exclusive Uni-point principle means that the saw blade always enters the wood at the same point in the table, regardless of the cross cut angle. Increases man-hour production by 25%.

20" HEAVY-DUTY BAND SAW
MODEL 72-B

Has every modern feature for precision heavy-duty production. Fully guarded ball-bearing wheels, ball-bearing roller guides, positive saw aligning and tensioning device. Direct or V-belt drive.

16"-18" TILTING ARBOR SAW BENCH
MODEL X24-B

Accurate and dependable for heavy production. All adjustments, convenient, easy-to-operate and safe. Capacity to 4½". Table 36" x 40". Saw tilts to 45°. 5-7½ H.P. Motors.

20" PLANER
NO 41.

Outstanding, low priced, general purpose planer. Turns out large volume of quality work at low production cost. Capacity 20" x 6". Two speeds: 24 and 36 FPM. 4-knife safety cutter head.

8" BALL-BEARING JOINTER
MODEL X-13

Precision machine for quality work. 3-knife safety head. Steel table lips, guarded front and back. 60" table. Heavy cast-iron floor stand. Tilting fence. Direct drive motor.

Send for literature giving complete details on Monarch Profitable-Production machines.

Manufactured and Guaranteed by

MONARCH

AMERICAN SAW MILL MACHINERY CO.

Quality Woodworking Machines Since 1903

204 MAIN STREET, HACKETTSTOWN, N. J.

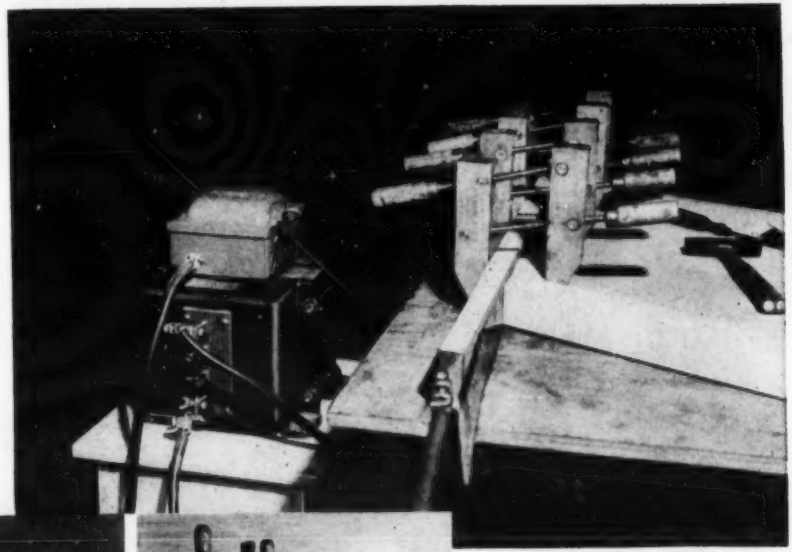
Faster, more durable
EDGE-BANDING, ASSEMBLY GLUING

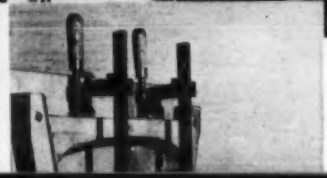
. . . with Borden's Resin Glues and the new resistance heaters

Here's how table-top makers beat shortages of certain types of assembly glues and metal edging.

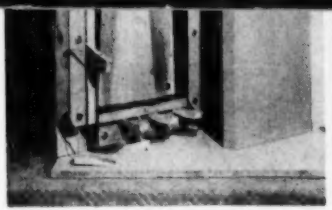
They use CASCAMITE or CASCO-RESIN urea resin glues . . . and bond veneer or Formica edge-bands in *one or two minutes* with versatile resistance heaters.

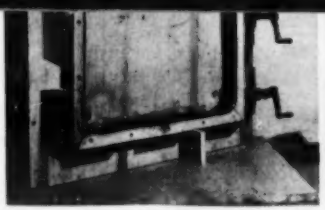
Borden's urea resins are easy to mix and provide long working life . . . yet they cure quickly under heat to form a durable, water-resistant, stain-free bond that "up-grades" the finished piece.

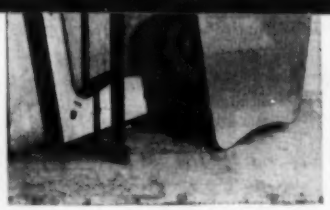




▲ Using the resistance heater without an assembly jig for "special order" edge-banding or repairing and patching. Curing cycle







dry powder urea resin glue: 30 seconds. The same method can be applied to corner joints, laminated parts, molded parts. Hidden joints can be preheated *before* assembly.

▲ Typical jigs, utilizing wedges and clamps, for edge-banding irregular shaped cocktail and lamp tables. Air hose may be used in place of wedges or clamps. Heater strip operated at about 300° F. Average curing cycles are 1 or 2 minutes with CASCAMITE No. 12. (Photos from *Baxter Crafts*, Bronx, N. Y.)

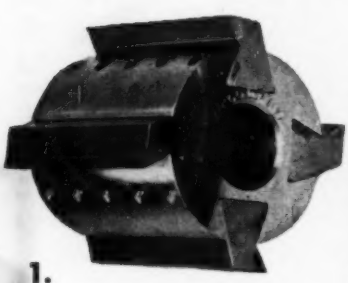
For good glues, and good advice on new equipment to do the job *faster*, call your Borden Glue Man . . . or write to: Technical Service Department, The Borden Company, Chemical Division, Dept. WD-71, 350 Madison Avenue, New York 17, N. Y.

▲ Set-up for edge-banding 3 edges of a table top. Power unit mounted under assembly bench. At right: close-up of power unit showing control switch and multiple taps to control heating speed. (Photos from *Long Island Beauty Supply Co.*, Elizabeth, N. J. Resistance Heaters made by *Washburn Electric Co.*, Englewood, N. J.)

Borden's

CHEMICAL DIVISION

Marcoloy Carbide Knives are cutting production costs on many different jobs



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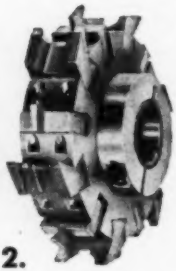

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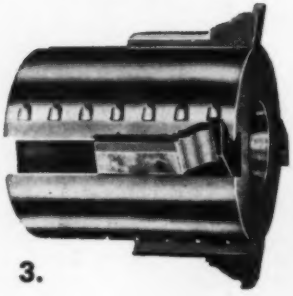

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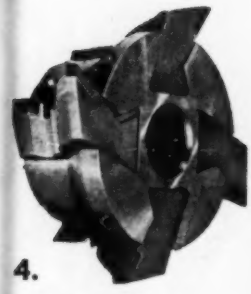

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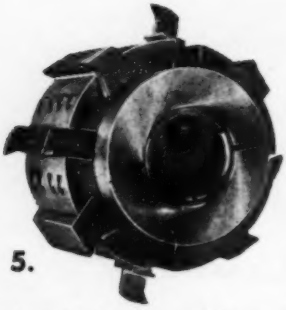

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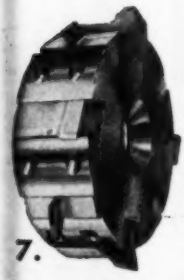


7.

1. Surfacing. **2.** Sash and Door. **3.** TV Cabinet Work. **4.** Silver Chest Work. **5.** Case Goods. **6.** Flooring. **7.** Moulding.

WHAT'S YOUR PROBLEM?

You may have the recommendations of Marcoloy engineers for the asking. Just send us a sample of the work, along with the necessary machine information.

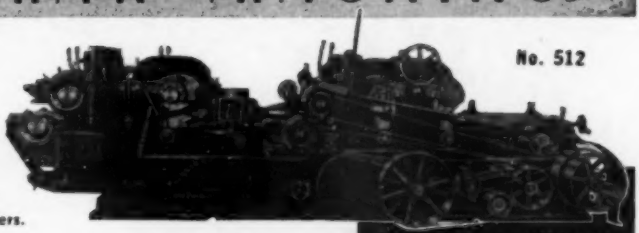
MARCOLOY CARBIDES

Marcoloy, Inc.

Springdale, Conn.

NEWMAN MACHINES

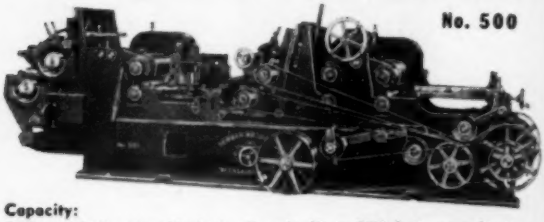
Newman



No. 512

Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

BALL and ROLLER BEARING PLANERS AND MATCHERS



No. 500

Capacity:
14" and 24" wide, 6" thick. Speeds 40 to 200 feet per minute. 7" cutting circle. Six alloy steel feed rolls. High carbon special alloy steel cylinders. Single or double profilers.

ORDER NOW FOR EARLY DELIVERY

ALL NEWMAN cylinders or heads are DYNETRICALLY BALANCED insuring an accurate and superbly finished product.

The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

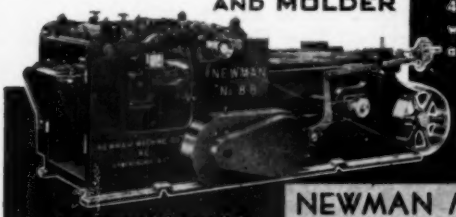
HEAD GRINDER No. 71

Ball and Roller Bearings

No. 55 AUTOMATIC PINEAPPLE FEED TABLE

The NEWMAN 55 feeds stock automatically to high speed planers and matchers up to 450 lineal feet per minute. Capacity: 30" wide, 8" thick. All adjustments and controls are centrally and conveniently located.

No. 8-B PLANER, MATCHER AND MOLDER



The NEWMAN 8-B planes 22" wide and 8" thick, joints 4" thick and will match 14" wide. 6" diameter feed rolls. Speeds of 30, 50 and 75 feet per minute.

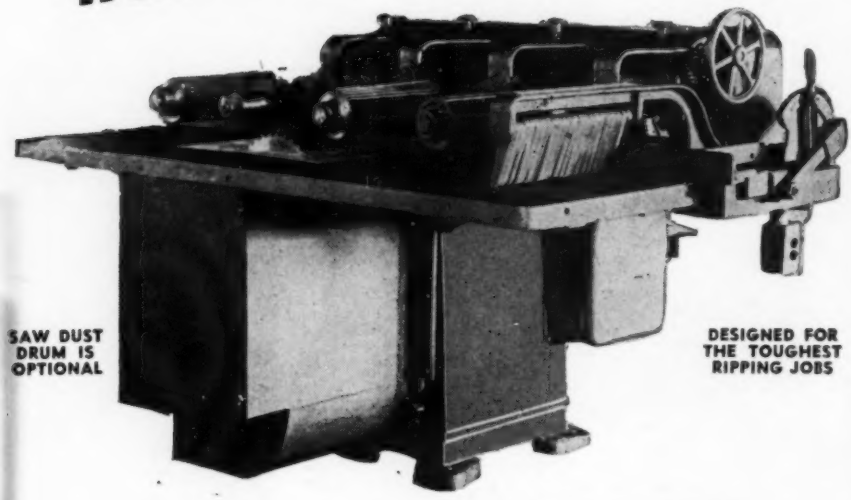
Unsurpassed for work in small and medium mills

- MAY WE SEND YOU FULL DETAILS?

NEWMAN MACHINE COMPANY, INC.
GREENSBORO, NORTH CAROLINA, U.S.A.

A REAL HUSKY...

NO. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW



SAW DUST DRUM IS OPTIONAL

DESIGNED FOR THE TOUGHEST RIPPING JOBS

FOR QUICK OPERATION - DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H. P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs.

Available for direct motor or V belt drive.

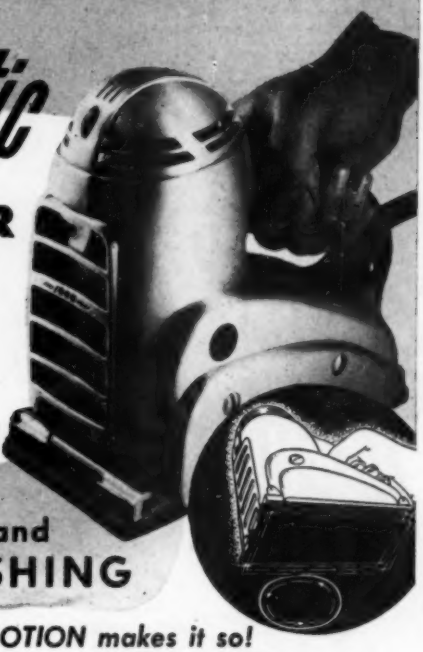
SINKER-DAVIS *Company*

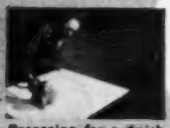
230-250 SOUTH MISSOURI ST. DEPT. 0 INDIANAPOLIS, INDIANA

PORTER—CABLE

Speedmatic

STERLING 1000 SANDER





Preparing for a finish for built-in furniture.

Finishing sectional shelf and cabinet units.

Sanding rounded surfaces with sponge pad.

Ideal for rubbing varnish, lacquer, etc.

Smooths joints and surfaces of kitchen cabinets, cupboards.

Ideal for cabinet and trim FINISHING

. . . ORBITAL MOTION makes it so!

Here's Why . . . You sand *with* the grain, *against* the grain, across the grain. Where the grain is irregular—where two pieces of wood butt at right angles — the orbital motion of the grits sands uniformly, regardless of the direction of the sander's path.

This is a real production feature — one that saves you plenty of time and labor. More! The Speedmatic-Sterling 1000 features *balanced lightness* for ease of operation. Weight only 8 lbs. At your Porter-Cable dealer's. For complete details send in coupon below.

PORTER-CABLE MACHINE CO.
5027 N. Salina Street
Syracuse 8, New York

Please send me full information on the Speedmatic-Sterling 1000 Sander — also name and address of my nearest dealer.

Name.....

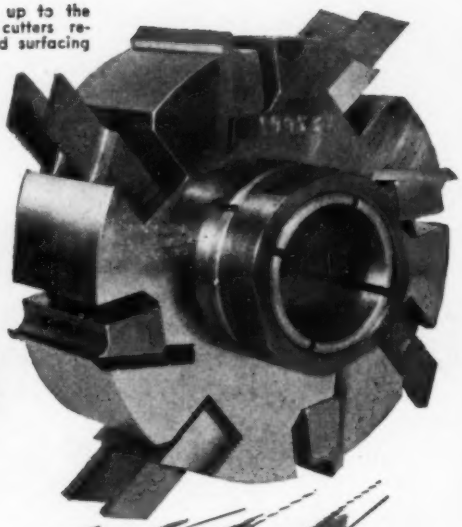
Address.....

City.....Zone.....State.....

Manufacturers of SPEEDMATIC and GUILD Electric Tools

In Canada Write: Strongridge Ltd., St. Catharines, Ont.

This Splitter Head is made in any length, up to the width of the machine. With the splitter cutters removed, the round head becomes a standard surfacing head.



No "Splitting" Headaches

Fact is, Diehl Design Engineers solve the trickiest splitting problems—as well as all other cutting problems, too—with their wide knowledge and skill in all phases of wood processing.

For example, Diehl designed this Splitter Head primarily to surface flat stock and cut it into multiples, such as the three square dimensions shown. However, these Splitter Cutters can be made in various forms to produce V or beaded ceiling; for grooving stock, such as drawer sides; or for rounding the corners on casing or like patterns. And, the head shown above can be adapted to efficiently handle these last three operations on small quantity runs. For large quantity, high speed work, special Diehl designed heads, of course, are required. To eliminate your splitting "headaches," write today for full details on Diehl Cutters and Cutterheads.

CUTTER DIVISION

On the Banks of the Wabash

THE G. M. **Diehl** MACHINE WORKS, INC.

WABASH, INDIANA • U.S.A.

M & M MOLDER PLANER

MOLDER and M M PLANER

FOR COST CUTTING MOLDING & PLANING *on the job!*

- Utilizes waste lumber
- Takes stock up to 4 x 11"
- Eliminates gouges, chatter marks, etc.
- One year guarantee against defective workmanship or material

SAFE . . . Cutters are recessed in head and protected on either side by pressure bars.

VERSATILE . . . Models can be changed from molding to planing in less than five minutes.

RUGGED . . . Finest materials available are used, including solid cast head, table, pressure bars and steel pulley.

PAYS FOR ITSELF . . . Converts waste stock into molding.

BENCH MODEL $67.50

FLOOR MODEL $94.50

Complete for Thickness Planing

FEATURES

1. Adjustable pressure bars hold work flat for precision planing.
2. Chips and sawdust ejected away from material and machine through head.
3. Four-knife cutter head.
4. Precision made arbors guarantee accurate setting of cutters.
5. Sealed-for-life ball bearings.
6. High grade tool steel cutters for heavy duty work.

WRITE FOR COMPLETE INFORMATION

EAGLE SALES CO. KEENE, N. H.

EAGLE SALES CO.

SUPREME BAND SAWS

● SUPREME BAND SAWS cut faster...have increased cutting capacity with minimum breakage! Present day high speed equipment demands SUPREME SAWS. Free from kinks and imperfections. Made from the finest Special Nickel Alloy Steels, tempered for toughness... to stay sharp! There is a Supreme Band Saw for every industry... for every material. Special purpose saws are made to order.

BEST FOR EVERY INDUSTRY

The SAW & KNIFE SPECIALTY CO., Inc.

6526 CARNEGIE AVENUE • CLEVELAND 3, OHIO

Let's Be ★ ★ ★ REALISTIC

There is probably nothing that irks Americans more than "controls." Yet, given the opportunity, human nature is such that controls are needed—to protect us from each other and ourselves. Our federal and state laws furnish some of these controls, but there are times when additional temporary measures are needed. Visions of the last war's controls are still fresh in our minds. If there were only some way to do without them it sure would be welcome—but is there?

Some divisions of our industry are already operating under controls and it looks like they will become more numerous and possibly more onerous as time goes on.

However, let's be realistic! We are engaged in an undeclared war which may get a lot worse before it gets any better. Chairman of our Joint Chiefs of Staff Omar Bradley believes present conditions may continue for ten or fifteen years.

Realistic businessman, Charles E. Wilson, has a plan for national mobilization which questions the need for such a prolonged condition provided we are fortunate enough to escape all-out war in the near future. He believes that if we all get down to business—labor, management and the public alike—by 1953 we can be over the "hump" in our mobilization effort and well on the way toward winning back whatever economic freedoms such mobilization effort may require us to suspend temporarily. Although Mr. Wilson's plan will require reduction in civilian consumption between now and 1953, we will still have more than we had prior to 1948. His plan will doubtless mean more controls, but isn't a short-term better than controls for fifteen years?

Let's be realistic and accept the necessary controls. Let's be realistic and make them work to put our mobilization effort well over the "hump" before 1953!

Ned Bailey
Editor-in-Chief

WE HAVE *Failed* AFTER 75 YEARS
TO SOLVE ALL NAILING PROBLEMS

But THOUSANDS OF PROBLEMS PREVIOUSLY CONSIDERED IMPOSSIBLE HAVE BEEN SOLVED BY . . . . . .

DOIG AUTOMATIC NAILERS

DOIG NO. 45-20-16

NEW FEATURES

A. Wheel on left allows operator to adjust back gage from operating position.

B. Solenoid trip permits operator to trip machine at any position desired.

★

★

STANDARD DOIG FEATURES

1. Anti-friction bearings
2. Three separate motorized drives
3. Nail feeder to handle nails from 1 to 3 inches without additional parts required.
4. Nail feeders to give 12 separate nailing combinations.

WRITE TODAY . . . we invite your requests for full details

WILLIAM S. DOIG Inc.

DEPT. 312 — 55 FRANKLIN ST., BROOKLYN 22, N.Y.

Pointed Paragraphs

You can help yourself by helping your help, particularly your new help and older help you expect to "up" to higher jobs. A well thought out and executed educational program will work wonders. We know from personal experience that this is an oft-neglected, but most important part of your business.

Don't underestimate the value of women and older men as workers, or do you remember what we learned about them in our factories during the last war? When the demand comes for the things your plant can make for both war and peace, don't be caught with your productive potential down.

In doing the research work for the series of articles "Know Your Wood," now running in WOOD WORKING DIGEST, I come on some amazing facts. Mr. Rutherford Platt, in his book "This Green World," published by Dodd, Mead Co., states that "it takes a good deal of imagination to think of water traveling up the long tapering cylinder of a tall tree in an unbroken column from the deepest rootlet to the topmost tiny twig and spraying it out through the perforations in the leaves as from a fine nozzle." Yet every leaf, and every blade of grass for that matter, is doing just that. What a wonderful world we live in.

Softwood plywood manufacturers should welcome NPA order M-63 reserving 20% of their product for government use. The order goes into effect as of July 1.

Cheerful acceptance of this order in most quarters stems from the fact that it won't mean much more of this material will be needed to make up that amount as about 15% of softwood plywood was already going to Uncle Sam.

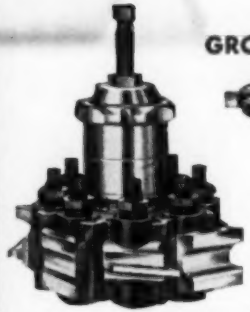
(Continued on page 40)

Put

New Features

into your

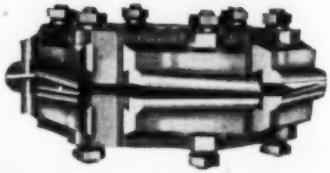
Sash and Door Operations

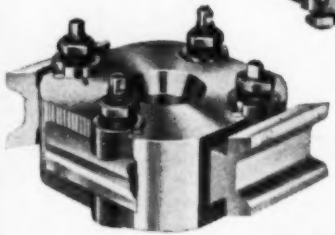


GROOVING DISC HEAD

DOOR HEAD CLOSED END

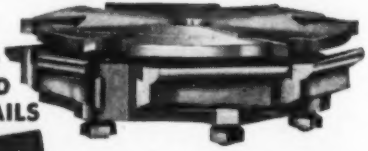
DOUBLE DOOR COPE





DOOR STICKING HEAD

DISC AND COPE HEAD FOR SASH RAILS



Cutterheads

with Yates-American 200 Series

Here's a brand new, precision-engineered line of cutterheads . . . "made to order" for sash and door manufacturers because they're capable of top-notch accuracy. Secret of the Yates-American design is the circular type bit clamp. It provides more positive clamping, more bits in a smaller cutting circle. In addition, micro-lateral adjustment permits pin-point bit tracking . . . your assurance that coping will fit sticking and that panels will fit panel grooves.

The 200 Series meets a long-existing industry need, offering woodworkers everywhere real production advantages —

STRONGER HEAD BODY— center portion of head body is unbroken — found in no other milled bit cutterhead.

POSITIVE BIT CLAMPING — prevents shifting, provides greater accuracy and safety.

MICRO-LATERAL ADJUSTMENT — for maximum setting accuracy.

MORE BITS IN SMALLER CUTTING CIRCLE — boosts production, improves accuracy and finish.

LONGER BIT LIFE — less length needed for positive clamping, gives up to 35 percent more bit life.

The 200 Series is a *complete* line of cutterheads—for any woodworking job. Write now for descriptive literature and detailed specifications.

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MATCHERS · BAND RESAWS · SANDERS · SURFACERS · CIRCULAR RIPSAWS

(Continued from page 37)

Now, however, instead of a few of the larger concerns having to supply the government, the business will be spread out among all the mills. This also will probably open new avenues of supply for consumer demand.

Sales by furniture manufacturers for May, although above the same month last year by nearly 20%, showed a deep dip, about 30%, from the month previous.

The Southern Sash & Door Jobbers Association and its affiliate the American Wood Window Institute, held its meeting recently. Clark E. McDonald, secretary-treasurer, has resigned and is now assistant to the president of S. R. Hungerford Company. Our best wishes to you, Clark, for your continued success.

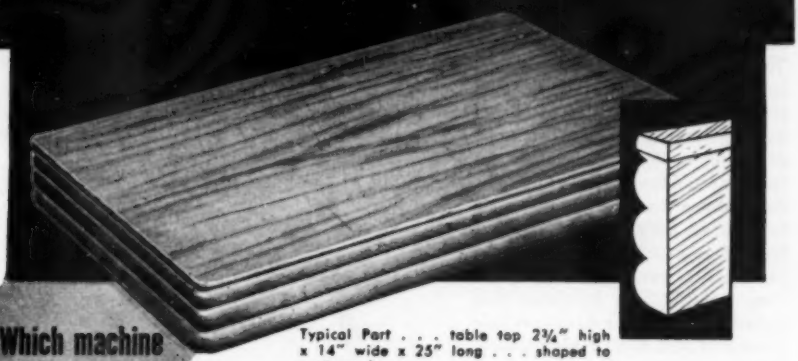
Between January 1 and May 15, 156 retail lumber dealers in 35 of the 48 states contracted for 700 weeks of Wood Window Program film service. These promotional films are selling Mr. and Mrs. America on the value of wood windows in place of metal. Do you want in on this remarkable promotion of wood? Write M. C. Davison, Houston Sash & Door Co., Houston, Texas.

This is the second year in succession that WOOD WORKING DIGEST has won the Public Interest Safety Award from the National Safety Council. Speaking of safety, this is no time to have accidents to your plant, your people or yourself. This month's safety section touches on this matter, but in addition, why not delegate some of your employees to see that all stairways are sound, well lighted and clear of all rubbish, tools, brooms, mops, etc.? Repair immediately all badly worn electric cords and any bare wires, and don't be a bulb snatcher.

Notwithstanding many transportation difficulties, the importation of logs into this country is improving. Quantities to supply current needs are now coming in from the Philippines of both logs and lumber. Shipments of logs from West Africa have improved and African mahogany is now coming in regularly.

Public relations—two words much used and much abused will continue to play an ever-increasing part in the successful conduct of your business. Whether you are dealing with your employees or the public conditions as they exist today, either demands your serious consideration of public relations. Competition with other employers including Uncle Sam and more selective buying by the public are reasons. Small or large, does your firm have an intelligently worked out public relations plan?

Will you be able to price it to Sell?

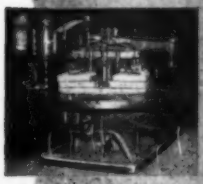


Typical Part . . . table top 2¾" high x 14" wide x 25" long . . . shaped to contour shown.

Which machine would you want?

HAND SHAPER
60 table tops per hour

POWER FEED SHAPER
120 parts per hour



ONSRUD AUTOMATIC SHAPER
250 table tops per hour

... it takes an ONSRUD *Automatic Shaper*

to meet *your* market price today!

Give yourself the advantage of an Onsrud Automatic Shaper to obtain the profit you need in manufacture. It is the lowest possible cost per part that gives the producer a price advantage over competition. In many cases the Onsrud Shaper will produce four times the volume obtained by hand shaping. Equally important is the quality of shaping through back knife cutting and the subsequent savings in sanding time. An unskilled shop hand can run the machine since the operator is only needed to load and unload. Onsrud Automatic Shapers are built in a full range of table sizes to meet any production need . . . to shape any type or size of part you might have. Let us give you the facts. An Onsrud sales engineer will be glad to analyze your present production costs . . . and will show you what this same production will cost on an Onsrud Automatic Shaper. There's no obligation . . . why not write today?

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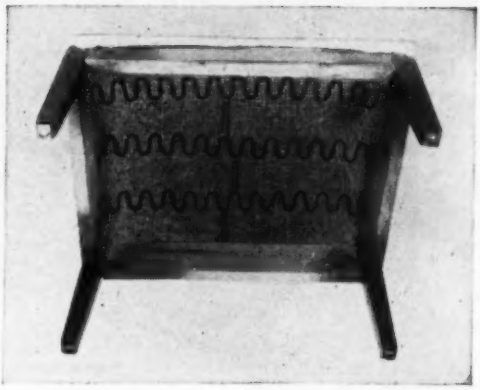
HIGH SPEED WOODWORKING MACHINES...PORTABLE TOOLS...AND ACCESSORIES FOR ROUTING AND SHAPING AND RELATED OPERATIONS

This illustrates the simplicity of seat cushion construction using Texlite with its built-in insulator. It doesn't show its durability. This was tested* by the United States Testing Company, Inc. They started dropping a 45 lb. sandbag 7" on to the seat. After 15,450 impacts—more abuse than the average chair takes in its lifetime—Texlite and its built-in insulator were in "good serviceable condition", to quote their report. The insulator was unbroken and the rubberized hair remained soft and cushiony, without lumpiness.



Built-in Insulator Vulcanized to TEXLITE® Rubberized Curled Hair Speeds Up Production—Builds Lasting Comfort Saves Labor and Materials

Texlite eliminates the time and expense of hand-picking and shaping a cushion filler. Each curled hair has been sprayed with latex and vulcanized in position...vulcanized to *stay* in position, and to add greater comfort.

You can speed up production further with Texlite's vulcanized cottonette insulator, a process and improvement exclusive with Texlite. This built-in insulator saves all the labor and time, and thereby much of the expense, of a separate insulator.

Let Texlite help you set the pace of today's competition in building better seat cushioning at less cost. Write us today for further informaton and samples.

*Test No. 21575—Aug. 3, 1950

THE SPONGE RUBBER PRODUCTS COMPANY

445 DERBY PLACE SHELTON, CONNECTICUT

New TECHNIQUES FOR THE *Modern* FURNITURE MANUFACTURER

by H. H. Connelly

PART I

WOOD in style, with all its natural warmth and beauty, was visualized on paper more than two decades ago by twentieth century designers; labeled "Modern" and tossed into the reluctant laps of manufacturers equipped with tools and machinery for making eighteenth century reproductions.

It is little wonder many threw up their hands and said, "We'll stick to conventional!"

As pointedly explained by one old timer who had cut his teeth on a Chippendale rocker, "It could just as well stayed Hepplewhite, or confined its curves to Sheraton and Goddard."

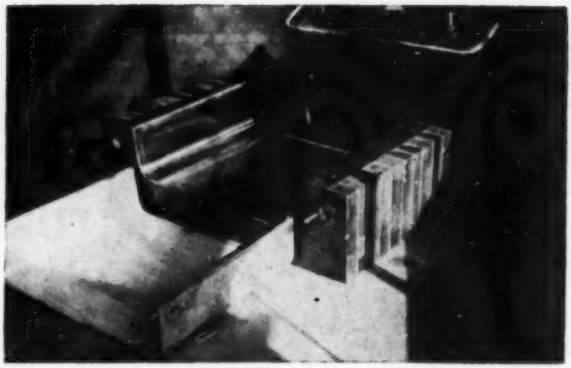
Nevertheless, manufacturers were increasingly harassed by the growing demand for Modern design which changed with the years from boxy forms, sheer surfaces, and usually unsymmetrical lines to a more functional design embodying graceful waterfall fronts, structural curves and decorations that pointed in the direction of simplicity.

With these changes in design and growing sales, there came competition and the urge to do a better job for less money and the "beef" that the designs were not practical. It is little wonder the manufacturers began to cast about for tools and methods designed to do a modern job.

The real fly in the ointment, however, has not been so much the fault of the furniture designers who could not foresee the difficulty of carrying out in the shops their paper designs—so radically different from the conventional styles—as it was the lack of engineering research available to the woodworking industry to cope with the problem dumped into their arms.

Consequently the process of producing perfect and permanent round corners, characteristic of Modern design, has been expensive and complicated. But in recent years engineering research backed up by the years of the toolmakers' experience has gradually narrowed this gap. Now, even the designers are finding it difficult to dream up something impossible for the manufacturer.

Making curved veneered furniture isn't new. Sheraton was gluing fancy figured veneer to solid curved cores to the characteristic Georgian lines before 1750. And to create something special where the attractive figure of veneer was important the figured



A carefully designed and machined gluing form for making three ply drawer shells. Note the felt inserted between the metal caul and the laminated form. Each section was made up of ten units shaped and bored separately, glued and bolted into one solid back.

veneer was glued to solid wood cores as a standard practice.

This method of gluing was necessarily crude but adaptable to the fine artisans of the eighteenth century. Hot animal glue brewed from obnoxious hides and hoofs was applied to the part to be veneered, followed by a gentle rolling pressure to the veneer, working from the center outward until complete adhesion had taken place. You can easily understand how unnecessary elaborate tools and forms were to the old masters using this crude method on tedious handmade furniture—a quite different picture from that of the present day production shop.

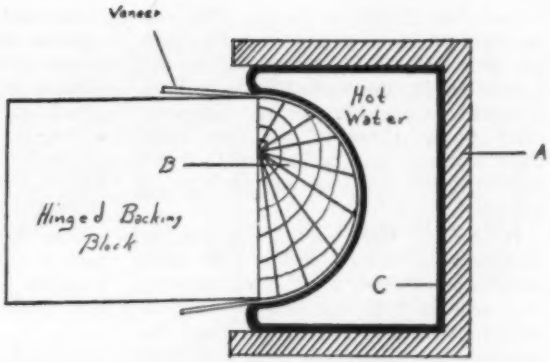
In woodworking circles there are generally seven accepted methods of producing curved wood parts for the furniture trade today, (1) hot plate gluing, (2) cold pressing in forms, (3) machine, (4) veneering solid lumber cores sawn to the proper curvature from large sections of wood, (5) molding bag technique, (6) bending by the flexible metal band process, and (7) bending by machining.

Consequently a careful study of each of these processes, their limitations and possibilities, will be of help in unraveling knotty producton problems for many manufacturers. However, as was found by one factory, after a careful study of the known processes, the direct application is not always the answer. Rather a combination of several and a modification of conventional methods was worked out that fitted ideally into the plant equipment and procedure. What is medicine for one is poison for another.

Hot Press Method

The hot plate press has many appealing characteristics for form gluing. Adequate pressure and a wide range of heat for any type of glue is available, a deciding factor in its favor. It does, however, require that the part takes pressure from one direction only and properly curved and heated dies must be machined with painstaking care. This is a necessarily long and delaying obstacle when changes in design are undertaken often. Because of frequent changes in design most concerns have abandoned the hot plate press method of form gluing and adopted instead methods calling for less expensive capital investment.

If you are contemplating the manufacturing of barrel staves or other similar items which are more or less fixed in design for years to come, the hot plate press will give years of satisfactory service and a highly economical instrument.



The bag molding technique has many applications in the modern furniture plant chiefly in veneering irregular surfaces where it is necessary to obtain pressure from a multiple number of directions.

Cold Pressing in Forms

Most curved members, fortunately, are adaptable to form gluing. With the advent of thermosetting phenolic, and urea resin adhesives, the early difficulty of slow setting glues has been overcome. Fewer forms are required and production is high. These forms are best made of wood for the simple reason that the material necessary for their construction is at hand. So are the skilled wood mechanics and tools for their construction.

It must be remembered, if you have a gluing problem, that pressure can still be exerted from one direction only, unless the forms are of special design with screws or clamps exercising pressure from a second direction. Also this type of gluing is limited to veneer lamination only and not to solid lumber cores.

Formed Gluing and Form Making Simplified

For the simple problems encountered in laminating drawer shells, curved chair backs and veneering curved members of furniture, little trouble will be experienced if the forms are: (1) made from well prepared wood and (2) meticulously machined on the same setup before assembling.

Wooden forms are like a piece of capricious solid furniture made from incorrectly conditioned wood—"They keep a-goin and a-comin'."

In the rush to get a new dressing stand on the market, a factory of my acquaintance used air seasoned oak for the form construction. Everything worked beautifully for the first few weeks. The parts came out with a good bond and perfectly curved for assembling. Then an unpredictable cold spell settled over the plant—one of those northern blizzards from the Artic—and the forms began to shrivel with the loss of moisture to the thirsty atmosphere and cracks and distortion resulted. Presently the space allowed for the three ply lamination between the male and female sections had opened wide enough for four ply and it was impossible to secure the necessary pressure for adequate adhesion.

Here's a suggestion worth remembering when making dies: a minimum of shrinkage or expansion will be experienced if the individual sections are made from laminated or veneered lumber cores with cross banding for stability.

Here's something else to chew the fat over, if you are designing a form. Plan the forms to hold sheets of multiple sizes, wherever possible, and cut the glued parts into sections after curing. You will find this practice of major influence in reducing manufacturing costs.

One manufacturer faced with the problem of form gluing a small three ply drawer back 2" wide with two ¾" radius bends, constructed forms to hold a sheet that could be cut into ten parts after gluing. However, the sizes have their limitations. These limitations usually being the press and mobility of forms.

In making form sections for laying the above parts, oak lumber cores were veneered with four 1/10" birch veneers, two crosses, top and bottom, to give added strength as well as to reduce the dangers of physical changes in the wood structures from climatic variations. These planks were then cut into sections and each part shaped on a shaping form accurately designed and machined for exact duplication.

The second step was boring to provide holes for bolting the sub-sections into one unit to form the male and female forms. Here care was taken to bore all parts on the same setup with a multiple spindle boring machine to insure correct alignment of holes. A small amount of glue spread between each part welded the units into one solid block when bolted together.

Importance of Metal Caul To Face The Forms

Regardless of the care taken to machine the dies, there will be some irregularities on the surface which bear the brunt of the load. Consequently dents and minor depressions will be left on the veneer surface in pressing the male and female forms together. For this reason a metal caul for covering the face of the male and female dies is recommended. It not only provides a smooth face for the laminations, but prevents glue from adhering to the face of the form. A non-corrosive metal of a thin gauge is best, unless the form is excessively irregular. A metal gauge of 18 proves quite satisfactory.

Regular ferrous metal has the uncomfortable habit of oxidizing at the slightest provocation and will leave rust stains difficult to remove from the surface of the wood. Even pure zinc metal will oxidize by the chemical reaction of formaldehyde and urea in synthetic glues after prolonged use. This is discernable by a deposit of white zinc oxide on the veneer surface.

One manufacturer finally had to resort to Monel metal sheets before a solution to the perplexing problems was found.

Felt Cushion Important

Here is an important factor seldom taken into consideration when designing forms. Provide an allowance for a strip of ⅛" woven felt to be inserted between the form and the facing metal caul.

Veneer, from the best of cutting operations, will have minute variations in thickness. Sometimes this is due to uneven shrinkage of veneer in drying, occasionally by difference in lathe setup. As a result of this variation, the thick points will receive more pressure than the thin, resulting in a poor bond at these points. On the other hand, felt will absorb the excess pressure and allow an even force on all points, insuring a safe bond over the entire area.

Bag Molding Technique

There are many gluing processes which require simultaneous lines of force from more than one direction to insure complete adhesion to all members being laminated. Examples are the curved body of an airplane fuselage, wing section, plywood boat hull, fuel tanks and even much of the fancy 20th century furniture.

The process is relatively simple. The fundamental principle involving the use of an inflated or deflated bag as one of the halves of a pair of molding dies or forms.

From this--- to this

every 2½ seconds

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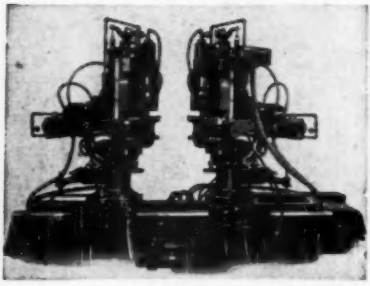

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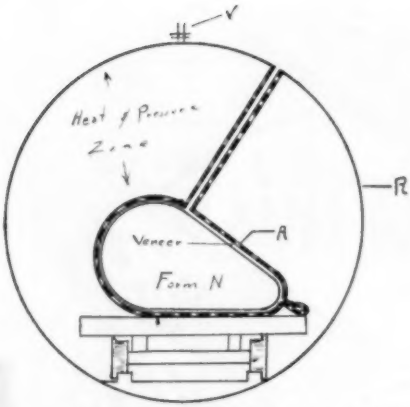

A cross section view of how a knowledge of the bag molding technique, plus an abandoned fire hose was utilized to solve a perplexing veneering problem for one furniture plant.

These bags are referred to as vacuum bags or pressure bags depending upon which process is used.

In this process the cross section illustrates how the veneer is first applied to a carefully machined wooden form N by fastening the first ply of veneer to the form by stapling. Between layers of subsequent plies glue is spread and the next layer laid diagonally to the succeeding ply. No danger is encountered by pre-setting as chemical change does not take place until the entire unit has been inserted in bag A and the air withdrawn by a vacuum pump and heat applied. With a vacuum of 15 lbs. the rubber bag hugs the surface of the form holding the plies of veneer tightly in place. It is now literally "in the bag" and the entire assembly is then sealed in a large retort R and heat and pressure applied through valve V.

A number of surprisingly simple variations have come out of a study of the bag molding technique—answers to puzzling problems that face the furniture manufacturers with every change of design, and there may be applications in your own operations or modified processes using the fundamental idea of bag technique.

One company was wrestling with the question of how to glue a strip of highly figured veneer to a half-round post to be used on a modern bedroom stool.

The answer was right at the foreman's feet—in fact he had to stumble over it before he recognized its possibilities. It was a ten foot section of abandoned fire hose. He attached a hot water connection to one end and an outlet valve at the other and came out with the simple unit illustrated by the cross section view.

To operate, he relaxed the pressure by opening the relief valve draining the water from the hose. The parts to be veneered B were inserted into the channel iron A against the relaxed bag C which held the veneer firmly in place until hot water under pressure was admitted to the hose. The hot water provided both the pressure and necessary heat to quickly set the urea formaldehyde glue.

(Continued next month)

"Do you suppose it could be green lumber?"

No. 232

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Motors, 3 ph, 220, 440, or 550 volt	3 hp 5 hp	3 hp 5 hp 7½ hp
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Work Table Size	22" x 32"	24" x 36"
Table Clearance	20"	28"
Height, Floor to Table	33" min. 40" max.	30" min. 40" max.
Actuated Travel	4" on table	4" on spindle
Collet Capacity	½"	½"

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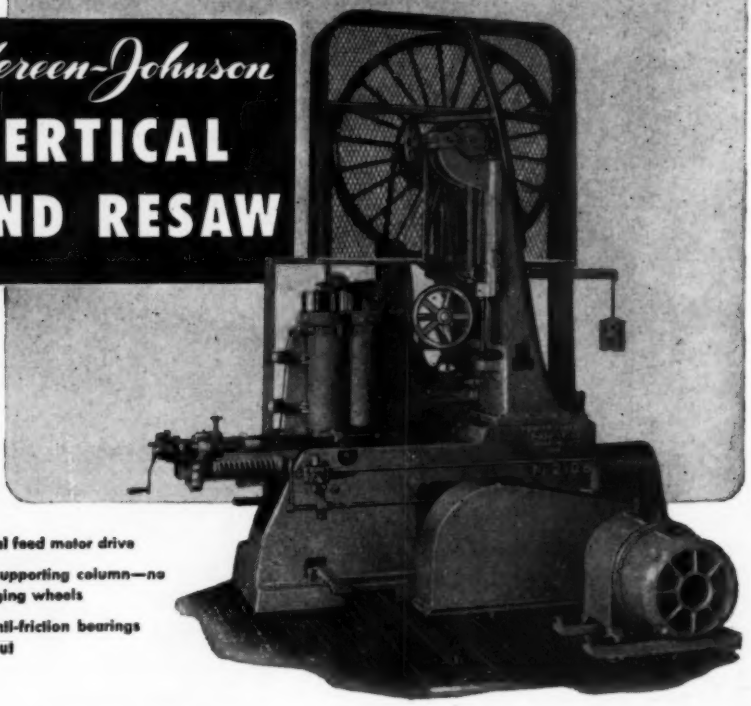
Mereen-Johnson VERTICAL BAND RESAW



- Individual feed motor drive
- Double supporting column—no overhanging wheels
- 100% anti-friction bearings throughout

Mereen-Johnson Resaws have special features that make for production economies and low maintenance costs. Eight feed rolls hold the stock rigid and eliminate "stock wobble". Variable feed drive—tilts for bevel siding. V-belt drive, 1200 RPM motor.

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Mereen-Johnson MACHINE COMPANY

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The CHICAGO Market

by E. McDANIEL

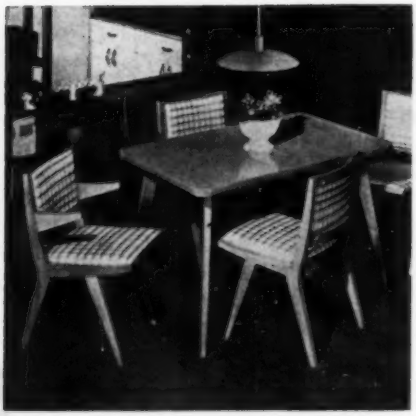
EXCELLENT weather, a comparatively good attendance and some excellent displays helped the Chicago Furniture Market to a good start. After traveling through the miles of furniture, greeting old friends and making new ones, we felt the overall picture was good. It is true that many people called it a dull market, but possibly our own skepticism helps contribute to an outlook such as this. It is unfortunate that concern over OPS regulations and other controls took so much of everyone's time.

However, this is a situation we cannot escape and would do better by realistically accepting the facts. Costs, taxes and wages are higher. Credit and government controls place a real burden on the industry, but this situation is not insurmountable and in time should adjust itself to some degree of stability. This was the first market to come under OPS regulation 22. July 2 was the deadline for filing of furniture manufacturers' prices with OPS. While price tags may not vary appreciably from January levels, furniture values are greatly improved.

Making any predictions as to what may follow this Summer Market is certainly a risky business. A big factor in the picture is the still well-stocked warehouses of many stores and dealers, but the psychlogical factor cannot be overlooked. As we have just said, some of the skepticism and pessimism may be in our own minds. Talk about rollbacks, etc. has helped many people hesitate in buying merchandise when it might be cheaper in a few months' time. However, we should not forget that the same technique, but with an opposite effect—has been worked on the public before— "Prices will be higher this fall, buy now."

Frank S. Whiting, Mart vice president, predicted that shortages forecast for the second quarter of 1951 will begin to appear in the third quarter months of July, August and September and will be noticed especially in the closing months of 1951.

There are some very encouraging factors which may be of real help in stimulating furniture sales this fall. Employment is at an all-time high as is also the continued marriage rate. Analysis of spending habits indicates that a very large portion of the American people's income is going for home furnishings. Shelter spending is down somewhat, but food prices may have taken up the slack here. Savings accounts have continued on the upswing



Clean line modern wood dinette set by Daystrom. Insurance against the future possibility of a shortage in metals for dinettes, this set is made of Japanese beech and covered in a plastic fabric with the feel of faille silk. Stain resistant plastic top simulates the grain of Japanese beech. The top comes in a variety of pastel shades.

and cuts in building have not been as great as earlier anticipated. Replacement buying may have been postponed, but there's a job to be done here to encourage this—if not promoted, this type of buying will and must take place sooner or later.

Basic raw material for the wood furniture manufacturer is good. And the simulated metal finishes may come to replace hardware such as knobs and handles even more so than they are at present.

It is rather interesting that the furniture market which underwent such a major transition during World War II, is again facing such a similar time. However, we are told that for the first time in history this second transition is being directed and headed up by many of the same men who played a part in handling business during World War II. We should all have learned something from the earlier mobilization program which can be put into effect today. No one wants to look too far into the future. At the beginning of 1951 many of us were willing to say that the first six months looked good. We have now completed the first six months and they have been pretty good for most of us.

General comment heard around the Markets has been that good business will continue, but possibly with some shortages by October. All-out war is a possibility, but we are now making plans on the assumption that it will be averted. If that is the case the temporary slow-up will be over as soon as

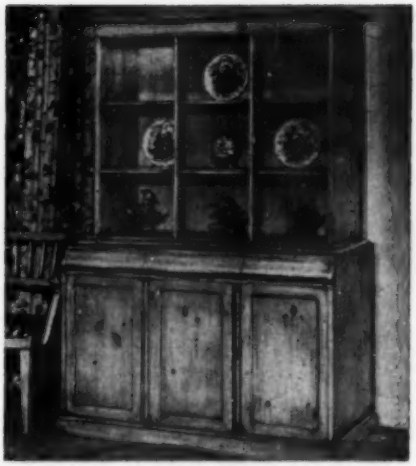
Casual Colonial furniture such as this Early American with a modern sparkle was shown for the first time at this 1951 Market. This is the "Countryside" line by the Crawford Furniture Mfg. Corp., Jamestown, N. Y., and has a light honey colored Pilgrim finish on hard rock maple.

inventories have been reduced to normal levels. Buying power will increase as more defense jobs are available. A Southern manufacturer predicts that '51 will be a big year dollar-wise for the furniture field. Other comments tend to caution us to watch current conditions, but not to be caught short on critical materials. A few are willing to say that good conditions should prevail for several years. At any rate the cauticus type of buying done at the Chicago Market should not be taken as discouraging. Many exhibitors were well pleased with the orders they received.

Style Trends

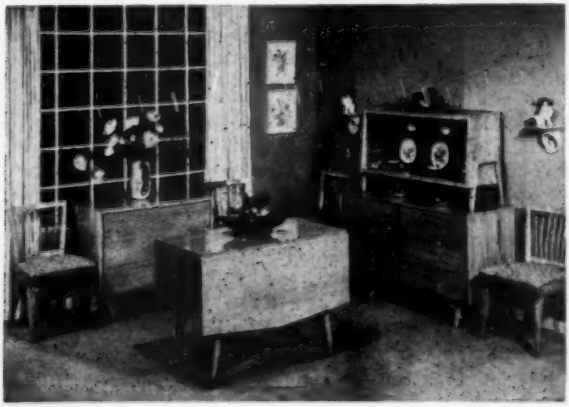
A greater awareness of style and design on the part of both manufacturers and retail buyers was evident at Market. There was a stronger showing of good design in medium and lower priced furniture than at any prior market. This is in response to growing consumer demands for better styles, color and design in all price categories of furniture.

Manufacturers that previously were content to turn out commercial furniture with little regard to design trends or to produce modern of questionable taste jumped on the style bandwagon; many have even hired famous-name designers.



Open deck china cabinet in the "Pinesboro" group was introduced by Menasha of Rockford. It is the American Provincial trend and finished in deep bronze or platinum gray.

While contemporary modern has increased its dominance of the market offerings, American Provincial has emerged as a strong style trend—a blending of contemporary with Colonial, American Provincial furniture is lighter and gayer in color, more casual and cleaner of line than traditional Early American pieces.



Bent wood parts come into their own in this dining room ensemble by Dillingham Manufacturing Co., Sheboygan, Wis. Wood is Wisconsin soft gray elm in a light wheat finish.

New budget dining group is this junior sized modern dining table. It is 40 x 66 inches closed and 80 inches with the addition of a leaf. Wood is Southern Bay; finish is nutmeg.

In producing the contemporary modern that has come to be known as American modern, designers have integrated ideas from Colonial styling. This cross-borrowing has brought a greater alliance between American Provincial and American modern with the result that they can be used to complement and supplement one another in the home.

Cherry and maple are being used increasingly in new modern lines. One company is featuring cypress wood in both a contemporary modern and a Colonial line. Oak, birch, Korina, mahogany and walnut are favorites in a variety of warm shadings. Finishes range from a dull hand-rubbed bee's wax finish to ultra high polish luster, and many table and case goods lines are featuring plastic tops in simulated wood grains.

Pastel shades are news in both fabrics and wood finishes. Wood colors have been given exotic or imaginative names like Morocco Sand, Coppertawn, Gobi Sand, Spanish Ivory, or such edible-sounding ones as Tropic Lime, Russet Cherry, Toasty Chestnut or Frosty Plum. Variations and mutations of grey continue popular in walnut.

In the past, the famous names in furniture design have too often been confined to a few high priced furniture lines and have been concentrated in the "left wing" extreme modern school. However, the new lines at this market were testimony that designers have come into their own in the great market of the middle millions.

Designers like Edmond J. Spence, Merton Gershun, and Leo Jiranek are turning out contemporary modern pieces that reflect the tempo of the times and that are priced within the reach of the many. Another distinguished name, Ralph H. Widdicombe, dean of American furniture designers with 59 years in the furniture industry, was represented at the American Furniture Mart with two completely new lines, one French Provincial and the other Colonial. Quality of craftsmanship and design are being made available in these new lines at prices within the best selling levels.

Better craftsmanship in cabinet work and greater attention to wood finishes were also typical of the new medium and popular-priced lines unveiled at the Summer Show.

As in the past several markets the predominant style is modern, modern and more modern. Approximately two out of three furniture pieces exhibited at the Summer show were modern, as compared with three out of five in January.

Of the traditional lines, Colonial and French Provincial have had a strong renaissance. New Colonial lines have been given a casual, modern treatment in design, wood color and in upholstery fabrics.

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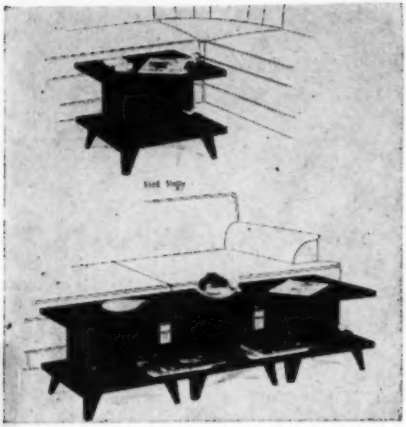

"Three-or-one" tables designed by Merton Gershun for American Furniture Co., Martinsville, Va., provide individual serving tables when used separately, or a sizable cocktail table when combined. They are finished in a "firelight cherry."

More new merchandise was shown by the 1300 exhibitors than was at first expected. One manufacturer brought forth a line of goods developed after thorough study of the field. This was the Morgan Furniture Company who are switching to upholstered chairs from the case goods field. Shipment of the new chairs is planned for August. The new collection of thirty chairs is designed for both modern and traditional styling and planned to cover the widest possible price range. Gum and ash are used in the low brackets, solid mahogany and more costly upholstery in the higher brackets. Edmund J. Spence developed and coordinated the designing.

The Mengel Company introduced a new line of occasional tables featuring functional drawers, plastic tops and diamond design worked out on the matched veneer surfaces of one group. Micarta plastic tops were used on one five-piece group.

There was continued progress in juvenile lines. Cribs seemed to be becoming stylized and a number of new pieces were shown. Some of these were cribs with drawers and toy-chest-seats. Decals seemed to be in the minority. Plextone, a finish seen in other applications, was used by some of these manufacturers. There were a number of hand painted designs and again the Western influence. High chairs, strollers, play pens and other items showed that manufacturers have made an effort to have these pieces serve dual purposes.

Special mention should be made of the Amergrain finishing process which was used on some pieces. This new process makes possible soft tones and pastels. The Lehwood Corporation of South Bend, Indiana is the developer of this finish. Pigment is applied dry rather than wet.

Heralding the improvement in public taste, Edmund Spence said that the battle for good design will never end. Discerning customers, he said are another factor to take into consideration along with prices and various controls.

MANUAL ON WOOD CONSTRUCTION FOR PREFABRICATED HOUSES

Construction techniques for wood prefabricated houses have been developing in the United States for several decades, but the knowledge gained was not readily available to the average citizen. Answering the vital need for a comprehensive guide on wood fabrication, this recent manual discusses such subjects of wood prefabrication as grading of lumber and plywood, strength of housing materials, protection from decay, insulation gluing, repair techniques and others.

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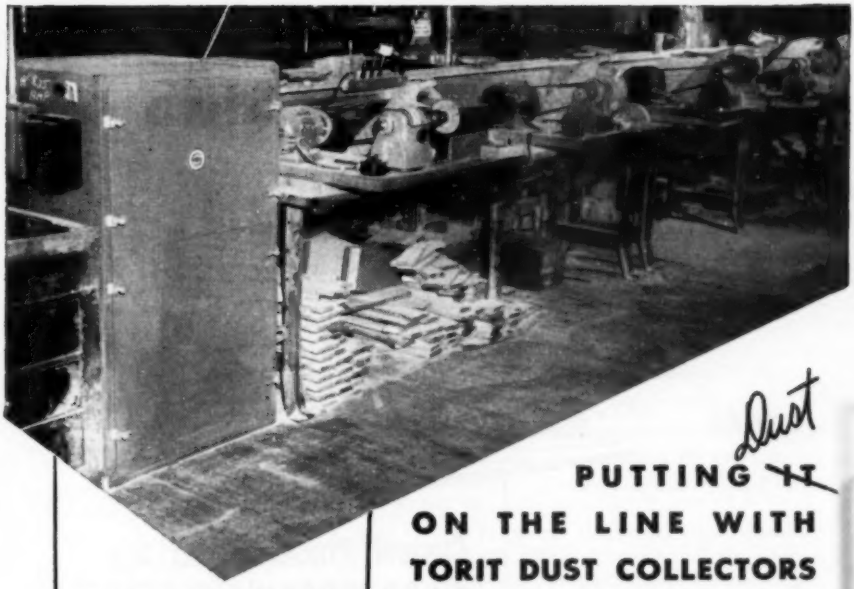

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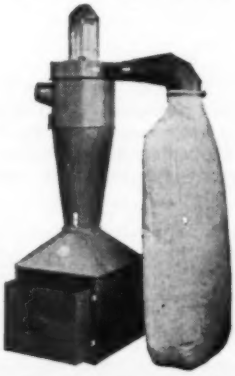
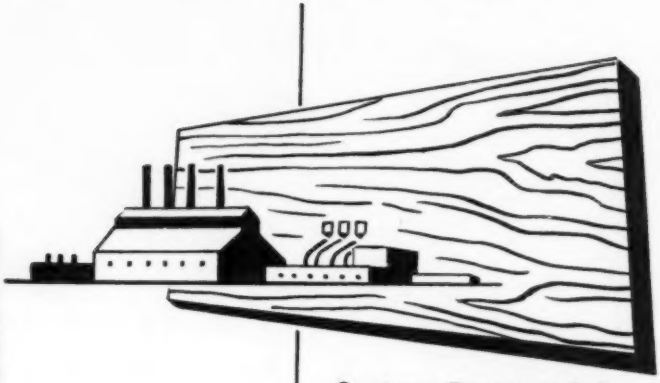


Torit also manufactures a line of cyclone type dust separators. These can be ordered with an after-filter, as shown above, which permits recirculating the cleaned air within the plant.

SYNTHETIC RESINS



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IMPROVING RADIO FREQUENCY EDGE-GLUING

by E. S. Winlund

Electronics Engineer, Westinghouse Electric Corp., Seattle, Wash.

Although the cost reductions and quality improvements obtained with RF edge-gluing are now very well established, there are a number of users whose results fall short of those known to be obtainable.

Rather than further proclaim the clear advantages of RF-gluing, this is a deliberately critical point-by-point analysis of factors affecting results, with recommendations for the proper solution of each.

Only a few of these critical factors are likely to be effective at any one installation. It is seldom difficult to identify them from their symptoms, and to apply corrective measures to get optimum results.

AS THE title implies, this report is intended primarily for the superintendent of an existing or contemplated RF edge-gluing or end-gluing installation, to help him obtain more production, better quality, lower fall-down, and lower cost of operation.

All comments refer to edge-gluing unless end-gluing is specifically mentioned. Edge-gluing is defined as the bonding together of the edges (narrowest sides) of boards to make wider boards or panels, as contrasted to lamination wherein the faces (widest sides) are bonded together. End-gluing may be used to (a) improve the grade of otherwise knotty lumber, by cutting out knots and re-joining the pieces, (b) to join the ends of moulding or lumber to make long standard stock or special lengths, or (c) to join the ends sufficiently for handling prior to edge-gluing to make panels.

In order to illustrate the effects of improper stock preparation, gluespread, etc. in many of the figures in this paper, it is assumed that the pressload is of such size and shape that 20 kilowatts will deliver 1000 volts to the electrodes, heating the glue to 180°F. in 20 seconds time, at which temperature it sets. This relatively large load would be rather typical in the softwood lumber country.

The furniture industry, on the other hand, generally operates with smaller pressloads, where 10 kilowatts is adequate. The illustrations are still directly applicable by dividing all power figures by two; that is 10 kw. would deliver 1000 volts, raising the glue to 180° F. in 20 seconds.

Stock Preparation

In our experience, the most important single thing that a new user of high frequency edge-gluing must understand is that the wood edges and faces must be flat and square with each other, considerably more so than was permissible with clamp carriers. The edges must have virtually wood-to-wood contact over their entire area be-

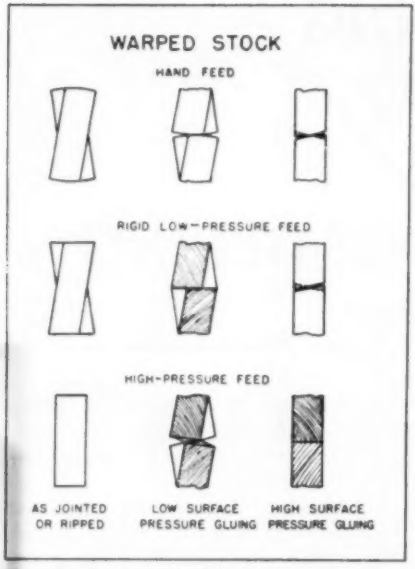

Fig. 1. Feed and gluing pressure as related to joint contact for warped stock.

fore glue is applied. This is obtained as follows:

Flatness

The stock must be flat before jointing or ripping the edges. A warp or twist will usually prevent a steady reference plane, as in Fig. 1, making the edge square perhaps at one point, but not elsewhere on its length. Chain-feed low pressure holding devices, however, will establish a sufficiently steady plane to handle softwoods with only a slight warp or twist.

Edge Condition

The edges must be straight as they come out of the jointer or ripsaw. This means that the stock must be held very firmly in transit and that the holding mechanism must be straight.

Feed-through grippers with excessively worn tracks and bearings can easily result in a poor joint. Excessively worn gripper teeth and roller knurling will likewise let the stock slip minutely in transit, resulting in a "hollow" or "high" joint. Cumulative hollow joints in a panel reduce or remove pressure or leave an opening at the center, as in Fig. 2, which shows estimated pressures. Hollow joints must be especially avoided in long panels and/or in hardwoods, because even fluid edge pressure has less chance to make up the deficiency.

The edges must be square as they leave the jointer. This is seldom a problem, occurring only when the jointer is adjusted out of square, or if the stock is not flat. As in Fig. 3, offsquare edges will (a) obviously put excessive pressure along one side of the edge and insufficient pressure or even an opening along the other side, (b) prevent uniform glue distribution, and (c) may crush wood fiber. But more important are the illustrated electrical effects which unnecessarily prolong RF heating time. In the example of Fig. 3, it is assumed that the off-square edge permits only ¾-inch-wide glue coverage on the one-inch edge, leaving ¼ inch without glue. The columns of figures show the voltages and consequent temperatures obtained in each ⅛-inch-thick layer of wood, at the left of a good joint, at the right of the off-square joint.

With 1000 volts between electrodes, a good joint divides this evenly into 125 volts across each ⅛ inch of thickness, because the glue is a uniformly good conductor. The result is that every ⅛ inch is heated at the same rate as every

Due to unforeseen circumstances, we are not able to publish another installment in Tom Perry's glue series. Next month we expect to have another chapter, concluding the series in September or October. This paper, originally presented at the 1950 Forest Products Research Society Annual Meeting discusses a subject of great importance to the woodworking industry.

other ⅛ inch, and they all arrive at 180° F. (assumed the setting temperature) in 20 seconds.

On the other hand, the off-square joint has ¼ inch without glue, the remaining wood being a relatively poor conductor (i.e., high resistance) as a result of which there is more voltage drop across each of the top two ⅛-inch sections than there should be causing danger of an arc. Likewise, the variable thickness of glue line results in very little temperature rise at its thickest point, and excessive rise at its thinnest. The result is that only about ¼ inch near the thin glue-line side gets bonded.

If the danger of arc is ignored (power kept at 20 kw.) and time is increased to 44 seconds, a little more glue is set. If power is reduced to 13.6 kw. to avoid the danger of arcs, the corresponding times are 29 and 94 seconds.

The overall result is that this one bad joint in a pressload of otherwise good ones (a) will not set up itself, and (b) may require increasing the RF heating time for the whole pressload from 20 to 29 seconds just to get away from the possibility of an arc. An arc would not be probable at 20 seconds (20 kw.); it is just that the safety factor would be virtually gone.

Thickness

The stock thickness should be uniform. This also is seldom a problem, as no difficulty is generally encountered for total tolerances of 1/16 inch. The effect of greater differences of thickness is to introduce an excessive series gap in the conducting glue line between electrodes, which, like off-square edges, lowers the voltage gradient in the glue and hence the attained temperature, as in Fig. 4. If high tolerances cannot be avoided, a satisfactory joint may be obtained by lowering RF voltage to avoid arcs and/or correspondingly lengthening the heating time, so that

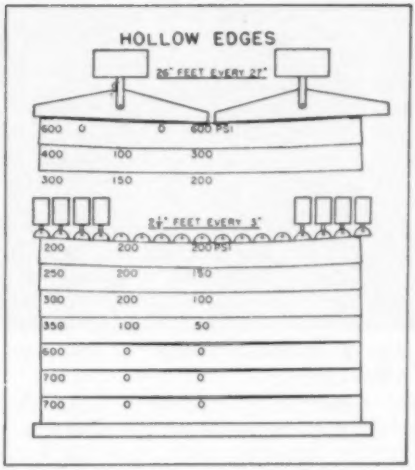

Fig. 2. How hollow edges affect glue pressure.

the proper temperature is obtained in spite of the lower RF voltage gradient. Differences of ¼ inch have been handled successfully in this manner.

For end-gluing, the best type of splice depends upon the strength demanded by the application. In Fig. 5, a conventional 12:1 scarf is shown, which has very great strength; however, it wastes considerable wood and sometimes the feather edge is difficult to handle. Much less wasteful is the finger joint, which gives very good strength but requires more complex cutters and higher precision. The zee joint requires simpler cuts and less precision, but generally has strength adequate only for normal handling prior to subsequent edge-gluing. Although with end-gluing a lower strength joint may often be tolerated, it is inherently more difficult to bond end grain. The scarf requires merely flatness, particularly if any displacement of the feather edges will later be machined off. The finger and zee joints require high precision and sharp cutters, since the two ends "bottom" into each other, and wood-to-wood contact

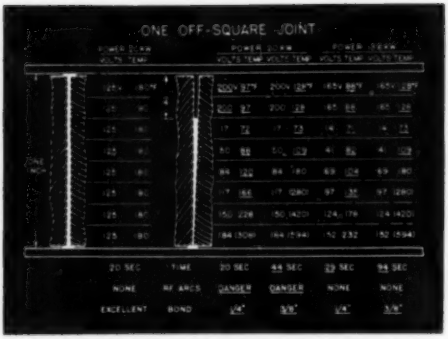

Fig. 3. Electrical effects of off-square edges.

is needed on all meeting surfaces. The stock must be held absolutely flat while cutting the ends, must be cut in very straight line across the stock, and square with the reference edges.

The electrical situation is not the same as for edge-gluing because the glue current path is always considerably longer (higher resistance) than the wood thickness. This and other field distortion effects cause a much greater part of the power to go into the wood, less into glue, thus provide lower effective efficiency, particularly for finger and scarf joints. One might say that the efficiency of end-gluing is somewhere between that of edge-gluing and lamination, where glue lines are generally parallel to the electrodes.

Accordingly, stock thickness tolerance may have less effect than for edge-gluing, because power is going primarily into wood, and the effect of small series air gaps is not so great.

Moisture Content

Moisture content must be controlled. There is evidence that the strongest bond occurs at 8 to 10 percent moisture Above 10 percent moisture content there is said to be a tendency for the glue resin (but not the water in which it is dissolved) to migrate into the wood, to dissolve in the water contained in the wood fibers. The resultant deficiency of resin at the glue line can of course impair strength. At 15 percent moisture poor glue bonds result. Below 6 to 8 percent there seems to be a gradual reduction of specific adhesion, possibly because the drier wood sucks water out of the glue, also resulting in impaired strength. It is especially helpful to keep moisture content up with staggered electrodes because of the increased moisture migration time available in the areas deliberately uncooked. Urea glues are more sensitive than resorcinols in this respect.

For most RF gluing applications, however, the bond strength is more than adequate even though reduced by off-optimum moisture content. Thus some other factors are generally controlling.

The usual edge-gluing operation places both wood and glue lines between the electrodes. When the available RF power develops a certain voltage across these electrodes, only about half the power goes to heat the glue lines and half goes to heat the wood. (While the temperature rise in the wood may be but a small fraction of that in the glue lines, it must be remembered that a lot more wood than glue line is heated those few degrees, thus the substantial power loss in the wood). It is like paralleling one 100-watt light bulb (the glue line) and say 10 small

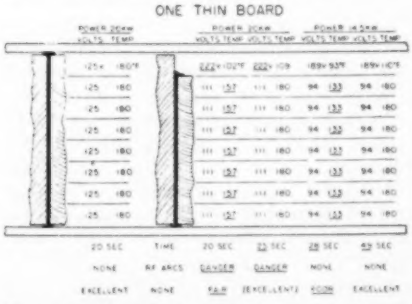

Fig. 4. Electrical effects of uneven thickness.

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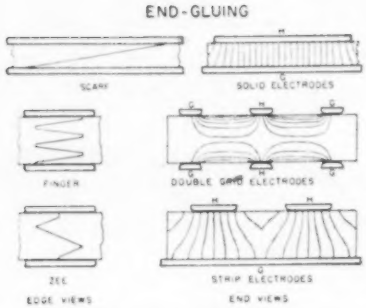

Fig. 5. End-gluing and electrode arrangement.

10-watt bulbs (the wood), all across the 115-volt line; both groups draw the same power, but the 100-watt bulb is much hotter to the hand.

The electrical "conductivity" (actually "loss factor") of the wood, and therefore the power loss in it, increases more or less proportionally to moisture content, except that a minimum is reached in the neighborhood of 3 to 5 percent moisture content below which a further reduction will not significantly reduce power loss.

As shown in Table 1, starting with optimum content of say 6 percent, half the power goes into glue and half into wood. Doubling wood moisture content to 12 percent causes one-third of the power to go into glue and two-thirds into wood. Since the glue power has been dropped from half to a third, the same time (20 seconds) gives a poor joint, or an increase to 30 seconds gives a good joint; not excellent, because glue migration is likely.

Halving the moisture content conversely permits a good bond in three-fourths of the time, or 15 seconds, but the rising voltage at 20 kw, causes danger of an arc. Therefore dropping the power to 15 kw, gives a good joint in 20 seconds without danger of an arc.

Accordingly a reduction of moisture content will always (except below 3 to 5 percent) reduce the power lost in unnecessarily heating wood, thus leaving more of the available RF power for the glue lines. This permits a shorter RF heating time and/or the use of less power.

Of course the primary reason for reducing moisture content has always been to provide dimensional stability and freedom from warping throughout the life of the product. In the 5 to 15 percent range, the uniformity of moisture content is very much better with a 5 percent average than with 15 percent, so that eventual stresses in and consequent warping of a glued-up panel is much less likely with the lower moisture content.

All of these effects result in the consensus that moisture content ought to be between 5 and 11 percent for RF edge-gluing, and generally the lower the better within this range.

Lower moisture contents can be tolerated with solid electrodes, but moisture migration from unpolymerized areas makes lower moisture contents inadvisable for staggered electrodes.

It is very important that edge-gluing be done within at most 4 to 8 hours after the stock is jointed or ripped; otherwise the flow of moisture into or out of the ends and edges will very likely warp the stock.

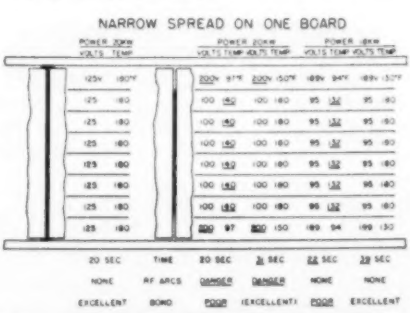

Fig. 6. Electrical effects of poor spread—poor spread on one board.

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TABLE 1.—MOISTURE CONTENT AND INITIAL TEMPERATURE

	Time Seconds	Excess	Power	RF Volts	Arcs	Wood Temp.	Glue Temp.	Line Bond
Moisture Content								
Halved	15	.....	20 kw.	1154 V	Danger	75° F	180° F	(Good)
	20	0	20	1154	Danger	77	217	(Good)
	20	0	15	1000	None	75	180	(Good)
Optimum	20	0	20	1000	None	80	180	Excellent
Doubled	20	0	20	816	None	83	143	Poor
	30	50%	20	816	None	90	180	Good
Initial Temperature								
20° F Low	24	20%	20 kw.	1000 V	None	62° F	180° F	Excellent
	20	0	20	1000	None	60	160	Fair
Optimum	20	0	20	1000	None	80	180	Excellent
20° F High	20	0	20	1000	None	100	200	Excellent
	16	Faster	20	1000	None	98	180	Excellent

For end-gluing, although the effect of moisture content upon end-grain glue adhesion is not known to the writer, the desirability of low moisture content from an efficiency standpoint is even greater than for edge-gluing, because here more power goes into wood. Probably it should be 5 to 8 percent, preferably 5 percent.

Stock Temperature

Stock temperature should be controlled. Initial glue-line temperature, and therefore stock temperature which directly affects it, is important in two respects. First, the higher the temperature the lower will be the glue-line temperature rise required, and therefore the shorter the RF heating time, as shown in Table 1.

Secondly, warmer stock is especially advantageous for staggered electrode presses, to help the deliberately unpolymerized areas to polymerize before excessive moisture or resin migration can take place.

Initial glue-line temperature is determined by both stock and glue temperature, to about the same degree, and by press room temperature to a lesser degree if the open assembly time is properly short. It should be in the neighborhood of 70 to 80° F., the higher the better so long as the glue pot is kept cool enough and spread, layup, and closure are fast enough to obtain full pressure before polymerization starts. Trouble with precuring is likely to be encountered above 80° F.

TABLE 2.—WOOD DENSITY AND GLUE CONDUCTIVITY

	Time Seconds	Excess	Power	RF Volts	Arcs	Wood Temp.	Glue Temp.	Line Bond
Wood Density								
Halved	15	.....	20 kw.	1154 V	Danger	75° F	180° F	(Excellent)
	20	0	20	1154	Danger	77	217	(Excellent)
	20	0	15	1000	None	75	180	Excellent
Optimum	20	0	20	1000	None	80	180	Excellent
Doubled	20	0	20	816	None	83	143	Poor
	30	50%	20	816	None	90	180	Excellent
Glue Conductivity								
Halved	40	100%	15 kw.	1000 V	None	90° F	180° F	Excellent
	30	50%	20	1154	Danger	90	180	(Excellent)
	20	0	20	1154	Danger	83	143	Poor
Optimum	20	0	20	1000	None	80	180	Excellent
Doubled	20	0	20	816	Arc*	77	217	(Excellent)
	15	.....	20	816	Arc*	75	180	(Excellent)

*Due to salt in glue.

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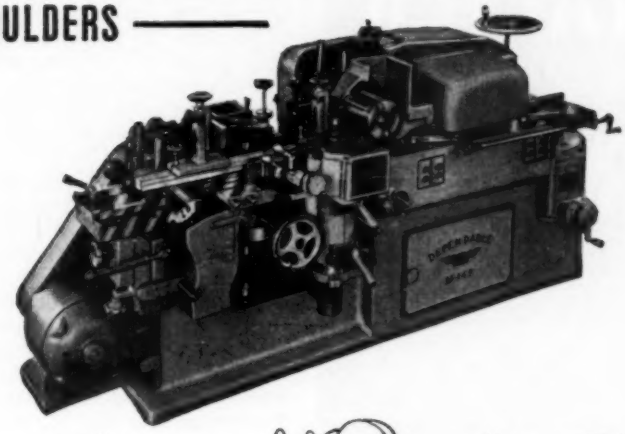

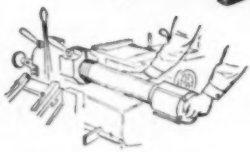

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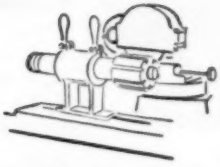
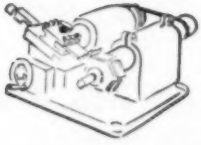


Head being ground on Cartridge Spindle Unit



Head being jointed on Cartridge Spindle Unit

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One method of obtaining high initial glueline temperature is to route the flow of stock through heated rooms or tunnels for a few hours prior to spreading, and to maintain the press room at 70 to 80° F. Another is to use suitable means to bring the edge temperatures up immediately prior to spreading, but this is more difficult than simply keeping a room or two ot proper temperature.

Aside from shortening the RF heating time and assuring ultimately complete polymerization, keeping a room or two warm also helps to obtain or keep the proper low moisture content and to keep the oil of hydraulically operated presses warm for faster reload action. Of course the warmer the press room is kept, the more desirable is a cooler on the glue spreader to maintain proper pot life.

The effect of initial stock temperature on end-gluing is greater than for edge-gluing because more power goes to heat wood. The wood should be at least 70° F. and preferably 80° F.

Species

Species affect heating time. The effect is shown in Table 2 and is similar but of often greater magnitude, than that due to variation in moisture content. For example, the denser softwoods such as Douglas fir and ponderosa pine will require a longer heating cycle than Sitka spruce or redwood because more power is consumed heating wood, less being available for the glue lines. Hardwoods not only require more power and/or time because of the greater density (more weight of wood to heat), but also because a stronger grip is needed to hold the boards together against the greater board stiffness.

The effect of species upon end-gluing, heating time is the same as for edge-gluing, except magnified by the greater amount of power going into wood.

Stock Width

Wide stock reduces gluing costs, up to a point. Obviously it (a) requires fewer glue lines per board foot, therefore permits a higher production rate, (b) requires less glue, (c) requires less layup handling, and (d) requires less machining time ahead of layup. However the problems of warpage and hollow edges multiply very rapidly with the width of relatively long stock, especially hardwoods.

To avoid the latter difficulty, most of the furniture industry has found it expedient to rip wide hardwood stock to 3½-inch width or less, and the watcher reverses alternate pieces at layup to avoid warping of the final panel. Thus the maximum practical stock width is usually determined by trial and error.

Glue

Modern resin glues, properly used, have greater strength than the woods they bond together. To obtain adequate strength for the application at hand, there are ranges of conditions within which they must be used. These conditions are more strict than those under which animal and other glues may be used with conventional clamp carriers.

Nearly all of the manufacturers of resin glues maintain regional technicians, usually the salesman themselves, who are experts in the proper use of their company's products, and who are more than willing to spend adequate time at the production facilities to assure proper conditions. Most of these men have very considerable experience with RF gluing, and have picked up valuable experience well beyond the mere use of the glue itself.

We cannot emphasize too strongly the value of asking one of these men to help with RF gluing problems. They don't always agree with each other, yet there is a broad area of general agreement between them and between

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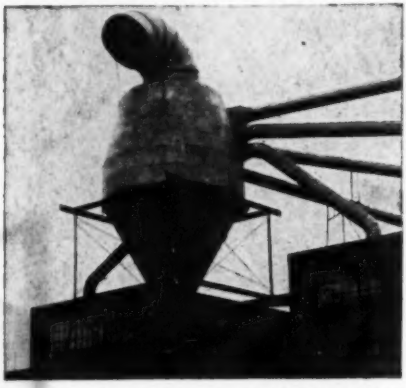

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electronic representatives, which for edge-gluing is listed below. End-gluing can usually be done with the same conventional resin types, but often the glue manufacturers can recommend special formulations especially adapted to the end-grain application. They should be consulted.

Resin Glues

Resin glues cannot compensate for poor stock preparation. Resin glues provide a superior bond, and can be polymerized or set very much faster than others, but they do not have good strength as fillers. That is, if an off-square or hollow edge provides an unduly wide gap between boards, and the attempt is made to fill the gap with a heavier spread, the resultant joint will be weak. Some resin glues, such as resorcinols and "gap-filling resins" are reported to have better filler strength than others, but the difference does not permit significant relaxation of the proper stock preparation requirements.

Catalyst Proportions

Catalyst proportions must be tried on the job. The proportion of catalyst or "hardener" must be chosen with care, starting with the manufacturer's standard recommendation. It ranges from 10 to 20 percent, depending not only upon the resin and catalyst chemical formulation, but also upon a number of conditions at the press. The electrode arrangement (staggered vs. solid platen vs. airgap, if any), size of press, RF power and frequency all affect interelectrode voltage, which, considered with stock thickness, determine maximum voltage gradient.

Some glues are more conductive than others, thus heat faster. If the catalyst contains, as it usually does, a conducting agent (sometimes table salt), more catalyst always gives higher efficiency (a higher percentage of power goes into glue, rather than heating wood) but the voltage gradient deter-

mines a maximum amount of catalyst that may be used without danger of arcs. The procedure generally is either to increase gradually the amount of catalyst until arcs occur too frequently, and then drop back to a lower amount of catalyst, or to reduce catalyst until pot-life is too short. This trial and error method is usually conducted by the glue manufacturer's representative, under production conditions. The effect of varying glue conductivity is shown in Table 2.

Different glue formulations, even among glues of one type (say urea) or one manufacturer, have different percentages of electrolyte, thus require different additions of salt for optimum operation, introduced by the glue manufacturer. Salt doctoring by plant personnel is not recommended.

Pot life generally decreases as the proportion of catalyst is reduced, but not always. There is always some percentage of catalyst, which may or may not be within the 10 to 20 percent range, below which a further decrease will increase the pot life. Obviously zero percent catalyst gives a very long pot life.

Glue Spread

Glue spread must be controlled. Glue spreaders are supposed to spread the glue so that there will be full coverage of the edge and uniform transfer to the opposing edge, under pressure, and a little squeezeout. The resulting film should be uniform if the edges are square and straight. Some squeezeout is desirable (a) to assure adequate spread, and (b) to help make contact with the electrodes. A series glues path between electrodes and the glue line doesn't cause arcs; it discourages them!

Either smooth or narrow grooved (say 1/16-inch wide "V") rollers with smooth or no doctor bars, or smooth rollers with narrow-toothed doctor bars, seem to do very nicely. Rubber

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seems to provide no advantage over metal rollers, and is often tougher to clean and costlier to maintain. Wide-groove rollers or other large-pattern roller surfaces often have a tendency to leave little unspread areas, even under pressure, especially when the glue gets thick, but they are sometimes helpful for slightly warped stock. Of course warped stock cannot be expected to permit a very good bond in any event. In some operations a rubber hold-down roll is very helpful.

Adequate glue spread generally runs 25 to 45 pounds of mixed glue per 1000 square feet of single glue-line area. Edge gluing may require 30 pounds for really smooth jointer edges to 40 pounds for rather tough ripped edges, or an average of 35 pounds for an average jointer edge or a very good ripped edge. Resorcinol glues are more alkaline than ureas, tend to penetrate more, and thus may require 5 to 10 percent more spread than the above figures.

If the glue spread is insufficient but uniform, the normal amount of penetration into the wood may leave too little for the glue line itself, resulting in a "starved" joint. Also since the deficiency of glue also provides a higher resistance glue current path between electrodes, less RF current flows to heat the glue, so it does not reach proper setting temperature and is usually damp to the touch when broken open.

If the glue spread does not extend across the piece (due to insufficient spread and/or off-square edges), the deficient area, being wood, is an undesired higher resistance current path in series with the remaining glue line, which identically prevents the glue from reaching proper temperature, as outlined just above. In this instance, however, there is an added danger of arcing due to the high voltage gradient

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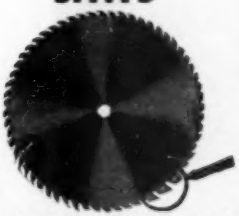
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occurring in the unspread portion of the glue line, as shown in Fig. 6.

The cumulative effect of insufficient spread, even if only on one or two edges of a press-load, is therefore to require a longer RF heating cycle just to get a bond on those few edges, or to avoid arcs.

Excessive spread obviously increases glue cost, takes a longer RF heating time to heat the additional glue, and increases cleaning costs due to excessive squeezeout. It should therefore be apparent that there is definitely an optimum glue spread, and that use of either less or more than that will increase RF heating time and general costs of the operation. Any unavoidable variation should be on the side of heavier spread, however.

The above comments apply as well to end-gluing, but glue spread must be especially well controlled because of the lack of opportunity for squeeze-out.

(Continued next month.)

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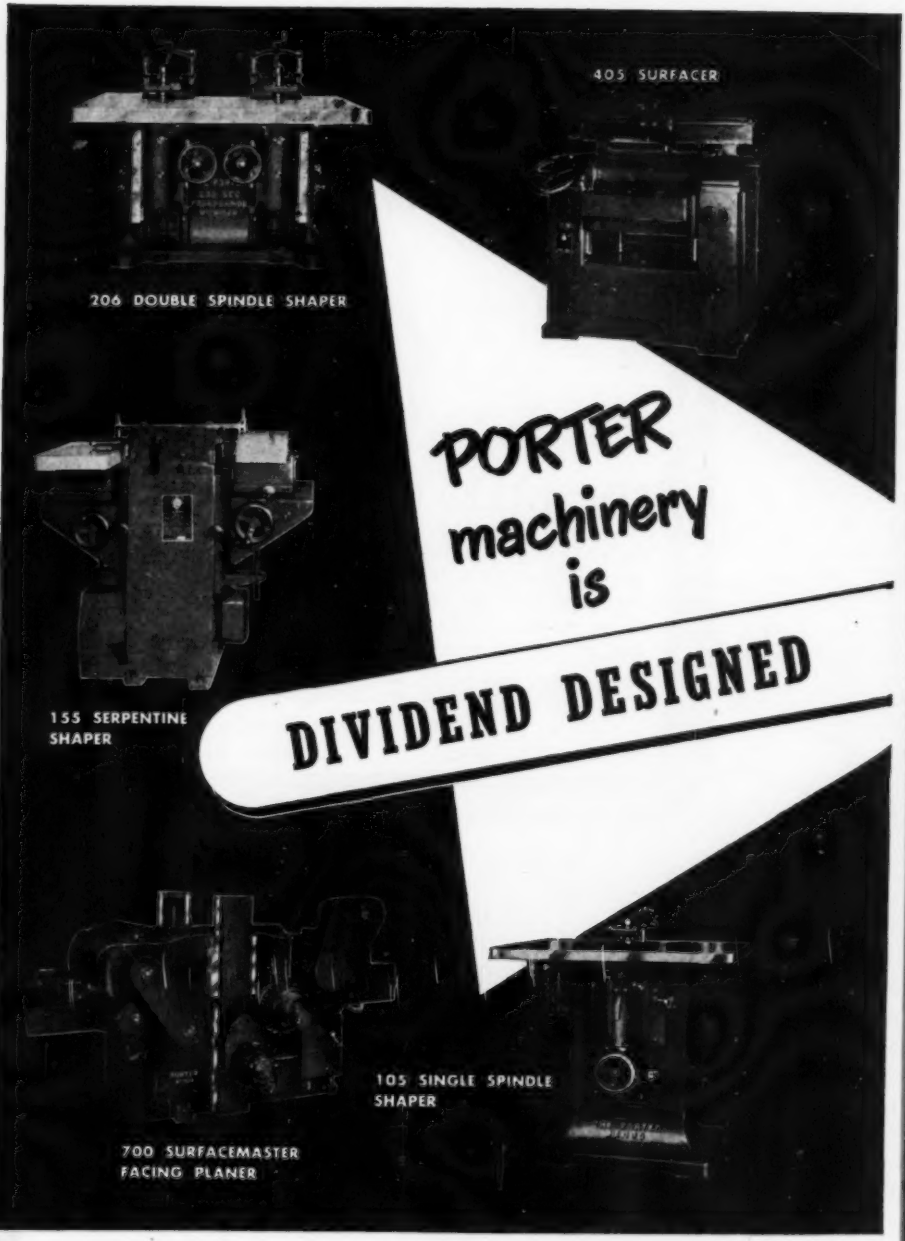
Indignant Patron: "Don't you see my signature?"

Teller: "Yes, that's what aroused my curiosity."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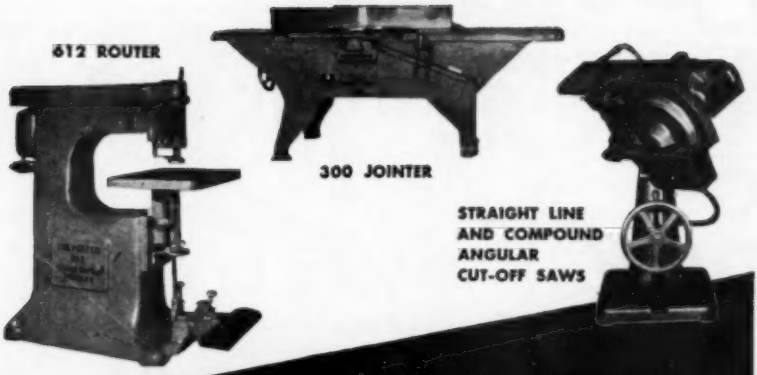

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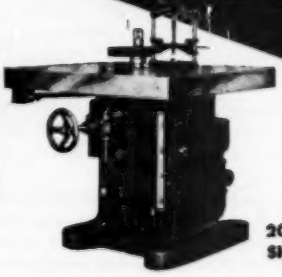

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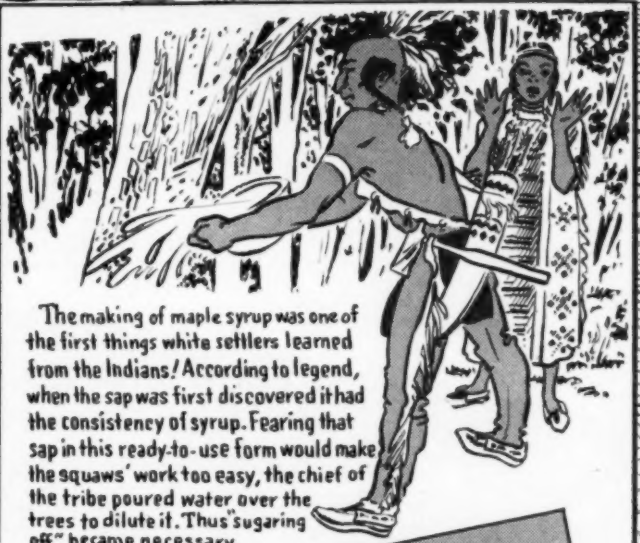

The making of maple syrup was one of the first things white settlers learned from the Indians! According to legend, when the sap was first discovered it had the consistency of syrup. Fearing that sap in this ready-to-use form would make the squaws' work too easy, the chief of the tribe poured water over the trees to dilute it. Thus "sugaring off" became necessary.

It requires more than 3100 lineal feet of 1 5/64 x 2 3/4 maple stock to construct a single bowling alley.

The second hardest of all native American woods, the maple is also one of the most versatile. It is used for manufacturing nearly everything from airplanes to xylophones.

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MAPLE

BY NED BAILEY

BROUGHT up on a farm in New England, one of my most vivid and pleasant memories is of gathering maple sap and making maple syrup. It is only natural because of this, as well as the tree's reputation for providing shade, and its autumnal beauty that everyone knows a maple by sight.

Today maple syrup and maple sugar are important annual crops on many of the farms in Vermont, New York, Michigan, Ohio, Pennsylvania, Maine and New Hampshire. The average tree produces between 15 and 20 gallons of sap annually and it requires between 45 and 50 gallons to boil down into one gallon of syrup. In 1940, about 2,580,000 gallons of syrup were produced and 550,000 pounds of sugar. The sap from some 10,288,000 trees was needed to supply this quantity of finished products.

Acer, the scientific name of the maple family, means hard or sharp, which possibly explains why the Romans used maple for their pikes and lances as well as for tables and other furniture. Nearly 100 species of maple are distributed over the northern hemisphere of which 13 are native to the United States. Maple trees and shrubs extend across the equator to the mountains of Java, and reach toward South America in the uplands of Central America. Most of the Old World species grow in the valleys of southeastern Asia, and many are found throughout Europe.

The more important species in this country include: bigleaf, Norway, red, silver, sugar and sycamore. These are also known by other local names, and there are many other specie that are important in local areas and for such purposes as shade and landscape planting.

From the volume of lumber and syrup produced the most widely known maple is the sugar, hard or rock maple. Classified here as the sugar maple. There is a botanical variation of the sugar maple too, known as the black maple.

The wood of the sugar maple is known to the lumber trade as either hard or soft maple and the bulk of maple lumber comes from this specie. The heartwood is light reddish brown, and the white sapwood often stains to a pale brown when improperly seasoned.

Although lighter than oak, weighing only 44 pounds when air dried, maple is stronger and stiffer, ranking as one of the more valuable hardwoods. As of 1946, the stand of sugar maple amounted to about 33,000,000,000 board feet. In that year the lumber cut of sugar and black maple was approximately 487,000,000 board feet.

Maple is used for flooring, shoe trees, furniture, agricultural implements, musical instruments and anywhere that

a strong, firm, close-grained wood is needed which will stay in place and take a good polish. Some forms, where the grain has been contorted, are known as birds eye or curly maple. The latter are used largely as veneers for paneling and furniture.

Maple's adaptability to a variety of living conditions probably explains its wide growth throughout the country. Sugar maple does best in gravelly, slightly alkaline soils. It grows slowly and for that reason is not too popular for restocking for sugar or lumber use although it is gaining a more important role in the management of forests in the north because it grows readily from seed. For landscaping and on streets and highways the sugar maple is popular. The seedlings and small trees are very easily transplanted.

With my fingers crossed, I state that to date the sugar maple is not vulnerable to any extent to the many insect and fungus pests we have with us today. Large limbs are often killed by the sugar maple borer and infrequently an entire tree succumbs because of boring under the bark and into the outer sapwood. Such attacks can be successfully met by pruning and burning the affected parts in the spring. Other pests such as the leaf-eating caterpillars, moths, green striped maple worms and the scales that attack the twigs can be controlled by spraying.

The distinguishing features of maples generally include the five-lobed leaf, buds growing on opposite sides to one another and delicately pointed, opposite branching and key-shaped or double winged fruit. Young trees have smooth silvery bark which becomes broken and deeply grooved as the tree matures. Maples that are forest grown have a small crown as compared with the park grown type. The forest maple carries its crown high on a long trunk,

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growing to from 70-130 feet, and from 2-5 feet in diameter.

Bigleaf maple is one specie that demands moisture. It is found along the Pacific Coast in altitudes from sea level up to 3000 feet in Washington and Oregon and up to 5000 feet in Southern California. Of the four western specie, bigleaf is the only commercial one. Bigleaf grows about 50-60 feet high and 2-3 feet in diameter in the open; in the forest it is often 100 feet high and 5 feet in diameter. Its life span is about 150 years. No other native maple's flowers compare with the large, yellow fragrant flowers which hang in clusters four to six inches long. The firm, fine-grained wood is light brown with a pale tint of red, and takes a high polish. The wood when air dried weighs about 34 pounds per cubic foot. There was about, 3,000,000 board feet of maple lumber produced from the forests of Washington and Oregon in 1945.

Most of the bigleaf maple goes into furniture manufacture with interior finish, boats, flooring, boxes, baskets. broom handles, saddles and pulleys accounting for most of the balance with the first three items being the most popular uses. Bigleaf maple burls and the curly and wavy wood occasionally found are prized for furniture veneer and novelties.

Silver maple and red maple are the soft maples so called by the Southern Hardwood Producers Association. Although found generally all over the eastern half of the United States, the area of greatest commercial importance is along the Atlantic Coast from southern Virginia through the Carolinas. The average yearly production of soft maple is approximately 90,000,000 board feet.

Soft maple because of its smooth surface makes an excellent base for paints and enamels, two coats with no filler are generally sufficient. It is also ideally adapted to the colonial maple style fin-

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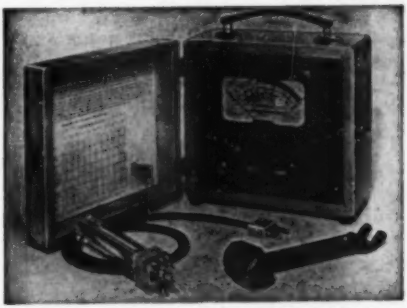

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ish so popular today. A defect that is found in soft maple has been more recently turned into an advantage when the wood is used for wall paneling, namely worm holes. In rustic surroundings such as in recreation rooms, country clubs, dining rooms, men's clothing stores, etc., wormy maple paneling finds a place.

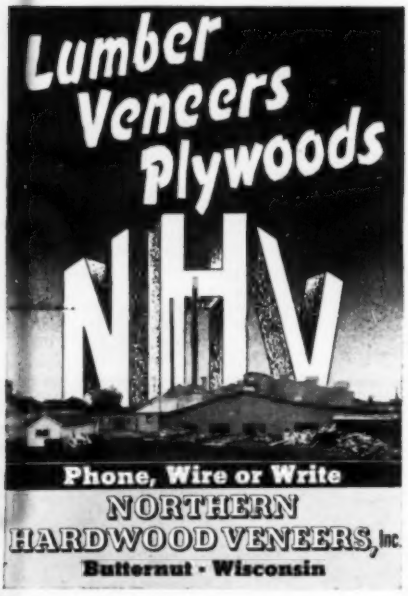
Although lacking the strength, density and weight of hard maple, there are many attractive features to soft maple not shared by any other specie of maple. In fact the things lacking in soft maple, just mentioned here, are often a handicap for many purposes. In appearance, finishing qualities and its behavior in service, soft maple differs little from other maples. Briefly, soft maple provides industry with a material which is easily worked, light in weight, economical and most important, attractive to the customer.

Sycamore maple is a species brought from Europe and cultivated here for many years. It is not called maple in England, but sycamore instead. The English refer to our regular sycamore as the "plane-tree." The botanical name of the sycamore maple is "pseudoplatanus," literally translated meaning false plane tree.

Sycamore maple in Europe ranks in value with our sugar maple and is an important tree there. One of the principal uses of sycamore maple here is for fancy veneer, figured wood sliced thin and artificially stained gray. This veneer is called harewood or silver greywood and is highly valued in cabinet work.

"Acer negundo," means a maple with negundo-like leaves in which each pinnately compound leaf has 3-7 irregularly margined leaflets. This is generally known in this country as the boxelder which is in reality a maple.

Boxelders often reach lumber size,



but are infrequently cut for lumber. With other soft maple, this specie is used mostly for crates, boxes, cheap furniture, slack barrels, handles, woodenware, charcoal, fuel and paper pulp. Low grade syrup or sugar is made from the sap.

Norway maple, although an import, is well known in the United States. Not so much commercially, but as a shade tree. In fact it has proved one of our best ornamental trees because of its pleasing form and hardiness. It grows rapidly in poor soils and is much more resistant than the sugar and silver maples and transplants readily. It is especially desirable as a lawn tree because the leaves appear earlier in the spring and remain later in the fall, finishing their season in a blaze of yellow leaves.

The End

WHY DO BUSINESSES FAIL?

"Survival Qualities of American Business," a 16-page comprehensive study made by Dun & Bradstreet, Inc., traces the expansion of business throughout the country by analyzing commercial and industrial failure trends.

In a section titled "Why Do Some Businesses Succeed and Others Fail?" the study brings out the fact that business failures are human failures —failures in judgment, personality, decision, ability and know-how. Business expansion and rate of failure during the past decade are compared separately in nine geographical regions of the U. S. Two out of every three concerns that failed in 1950 had been in business for five years or less. Another section is entitled "The First Five Years Are The Hardest," which reveals the year in which the concerns that failed during 1950 started in business.

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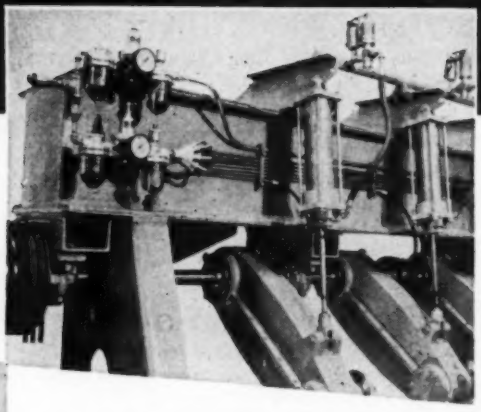

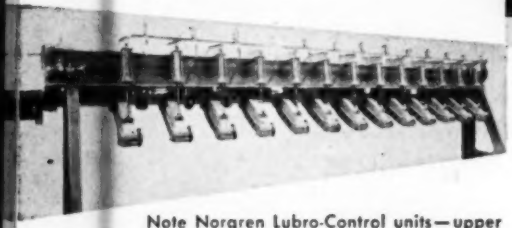

Note Norgren Lubro-Control units—upper one serving six ladders at far right, lower one serving seven ladders on near end of trimmer. Note oil-fog distributor and take-offs to each ladder, above right.

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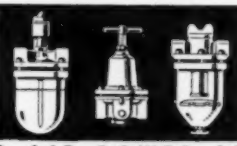

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There are so many things being done by compressed air and so many things that could be done in the woodworking field with it that we are astounded because more attention is not being given to the subject by such organizations as the Compressed Air Institute and the Forest Products Research Society. The use of compressed air in the woodworking industry has many and varied applications. The reasons are basic and logical and any manufacturer not taking advantage of the facilities of compressed air is not giving his business the attention he should. We say this because of the many plants who have investigated the matter and found lasting benefits in utilizing compressed air whenever possible.

The power of compressed air is great and can be had for a comparatively small investment. We say investment rather than cost because of the continued value of air compressor, air compressor controls and equipment will bring. Compressed air today can be controlled in such a manner that one can regulate tremendous power and pressure with finger tip control. Newer methods have eliminated the old-time hammer blow and substituted a valve control making possible a gradual application of the needed amount of power or pressure.

The experience of plants using the proper cylinders and valve controls is that operating costs were reduced from 100 to 300%. Besides this saving in operation, material costs were reduced as compressed air equipment took the place of some of the other tools.

The non-user should be interested in what compressed air will do for him, but the user should also investigate to see whether he can make additional use of compressed air equipment. Some of the new air clamps, hand lever control valves, improved pilot valves for remote control operation and valves that can be accurately timed. To speed up cylinder operation there are exhaust valves that will quickly empty cylinders. There are air pressure regulators for reducing air pressure and holding it uniform. Air line lubricators are now available for automatically lubricating cylinders, chucks, clamps, etc. Yes, the equipment is available and the rest is up to the manufacturer to see how it can be adapted to fit his operations.

There are hundreds of applications where cylinder power is used to advantage in operations involving a push, pull, lift, press or clamping movement. Remember, cylinder power is smooth, dependable, efficient and economical for the actuation and control of many

types of machines and equipment. It gets things done faster, better and more economically. You may be able to modernize your present equipment by the addition of an air cylinder or control valve. If you want further information on the subject write to WOOD WORKING DIGEST.

MACOBA PLYWOOD

Macoba, also known as African cherry, is now being stocked in plywood panels by the Aetna Plywood & Veneer Company, 1737 Elston Ave., Chicago. Other names are Makore (Ivory Coast), cherry mahogany (England), African pearwood (Germany), and is known on the Gold Coast as Paku, Abaku, Makure, Makwe.

The reddish-tan color, close hard texture and high strength make Macoba desirable for furniture, wall paneling and store fixtures. The texture is finer than that of mahogany and the wood is denser, harder and heavier, weighing from 40 pounds to 50 pounds a cubic foot, seasoned.

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Condensed into 24 pages, the Parker-Kalon assembly handbook presents the essentials of P-K self-tapping screw selection, application data, recommended hole sizes and corresponding drill size numbers for wood, plastic, plywood and metals. All of the information is up-to-date and many of the tables conform to the latest recommendations of the American Standards Association.

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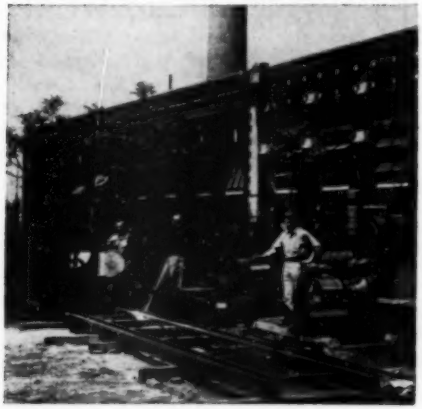
ENTERPRISE SAWMILL

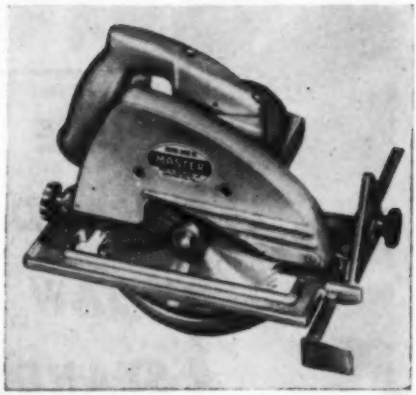
The Enterprise Company of Columbiana, Ohio, sawmill machinery builders and engineers for over fifty years, displayed one of their latest Model 21 Sawmills at the Industry Show of the Forest Products Research Society in Philadelphia's Convention Hall, May 7-11th. The sawmill was in actual operation throughout the entire week in the outdoors logging area where leading manufacturers of chain saws and other logging equipment also had demonstrations.



The Enterprise Model 21 sawmill on display, which was one of the company's smaller size mills, had 40 in. opening headblocks, carried a 60 in. ⅞ gauge Simonds saw, and was powered by a Hercules Model RXC 110 hp six cylinder gasoline engine with twin-disc clutch. The sawmill was also equipped with an Enterprise set works and a specially-designed power receder for receding or advancing the headblocks under power.

PORTABLE 6¼" SAW INTRODUCED

The availability of a new electric portable circular saw has been announced by the Master-Taper Company, 4531 N. Beacon, Chicago, Ill. The Ramsaw is equipped with a 6¼ inch



blade which allows for cutting through 2" stock on a 45° angle. The ¾ h.p. motor is housed in a light weight aluminum housing, placed at the left of the blade for easier cutting. A built-in bevel and depth adjustment are integral parts of the saw and they are easily adjusted and remain accurate.

The Ramsaw features a plastic window in the guard which allows the user to see the line of cut at all times. An adjustable rip fence extends to eight inches for precision ripping. Safety trigger switch in the handle cuts off motor when the operator's finger is removed from the switch. Lower safety guard covers the blade at all times and cannot become clogged with sawdust.

BAND SAW ATTACHMENT

The capacity of the Delta standard 14" woodworking band saw normally 6" can be increased to 12" by using the No. 894 height attachment which consists of a cast-iron raising block and necessary fittings, according to the Delta Power Tool Division, Rockwell Manufacturing Company, Milwaukee 1, Wisconsin. With the height attachment in place, it is possible to efficiently band saw material 12" thick, thus providing a tremendous cutting capacity at low cost and horsepower requirement. (A ½ hp motor is sufficient for heavy duty cutting.)

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MODERN FASTENERS

Heli-Coil Inserts

By J. O. Forster

INCREASED use of plywood and laminates have been greatly facilitated by the development of adequate fastening devices and methods. One method of preparing the wood for a fastener is discussed in this article. Usually a hole is drilled in the plywood or other material and the fastener inserted. However, extensive tests have been made with wire thread inserts and as a result these are recommended for some applications. These inserts, while not a cure-all, can provide stainless steel and phosphor bronze threads in wood that have greater wear resistance and higher loading strengths than threads made directly in this material.

Factors governing the relative effectiveness of these inserts in a particular application are: the type of wood, the direction of grain, the moisture content, the loading strengths desired, the necessary length and diameter of finished thread, space limitations, the ability of the wood to withstand tapping without powdering, the advisability of using finishing or roughing taps, the determination of necessary insert size, and the best procedure for installation. Of these, the two most pertinent considerations are: (1) the methods of tapping and (2) the strength of the wood under consideration.

Before discussing methods of tapping and other factors, here is a definition of the Heli-Coil inserts which are discussed in this article.

Heli-Coil inserts are screw thread bushings of helically coiled wire, with the precise diamond-shaped cross section to accommodate standard thread profiles. Heli-Coil inserts are regularly made of stainless steel or phosphor bronze. For through holes, a notched insert is furnished to permit any break-off of the tang. Blind holes do not require tang removal; therefore inserts for blind hole applications are furnished unnotched. The Heli-Coil insert, when assembled in a Heli-Coil tapped hole, conforms in all respects with standard specifications for screw threads.

Tapping Methods

Although best receiving threads in wooden members are fabricated with taps specially made for cutting wood, satisfactory results can be obtained with steel cutting taps if precautions are taken so that the cross sections of the threads are not weakened during the cutting action. There are two ways of tapping—one using finishing taps, the other using roughing taps.

The first method produces threads that allow easy installation of the insert. However, strength values for these threads are usually low because the finishing taps cut deeper into the fibres of the wood than would the conventional "wood taps."

Tensile Load Values of Receiving Threads in Hard Wooden Dowels for Heli-Coil Inserts

Nom. Size of Insert Int. Thrds.	Length of Engagem't. (In Inches)	Finish-Tapped Wooden Receiving Threads: Failure Load (in lbs.)	Type of Failure	Actual Engagem't. (in Turns)	Rough-Tapped Wooden Receiving Threads: Type of Failure	Failure Load (in lbs.)	Actual Engagem't. (in Turns)	Percent Increase in Loading Strengths of Rough-Tapped Over Finish-Tapped Holes
¼-20	¾	950	STH[2]	13½	1760	STH	14	85.2
	1	1265	STH	20	2260	STH	19	78.9
	1¼	1500	STH	25	2710	STH	25	80.7
⅜-16	1⅛	2265	STH	16½	3360	STH	17½	48.4
	1½	3110	DS[3]	24	3940	STH	24	——
	1⅞	3680	STH	30	4700	STH	28½	27.7

1) — As compiled from tests made at the Pittsburgh Testing Laboratory, Pittsburgh, Pa. on 1.030-in. diameter hard maple dowels having 5500 psi compressive strengths.

2) — STH — Stripped Tapped Hole

3) — DS — Dowel Split

The second method, using roughing taps, makes assembly slightly more difficult but produces threads of much higher loading strengths. This, since the tap cuts less deeply into the wooden stock. During installation, the insert follows the partially cut thread contour and compresses the remaining wood, thus forming the final full-depth thread.

In addition to these methods in which the hole is threaded to take on the helical wire thread insert, another method of hole preparation is possible in which no tapping is done at all. In this case, the hole is drilled out slightly larger than needed and, theoretically, the full depth of thread is achieved as the insert is turned into the hole. Although this method can produce satisfactory results, in most cases the full thread form is not achieved. Thus, usually, the most satisfactory method of hole preparation is the roughing-tap method.

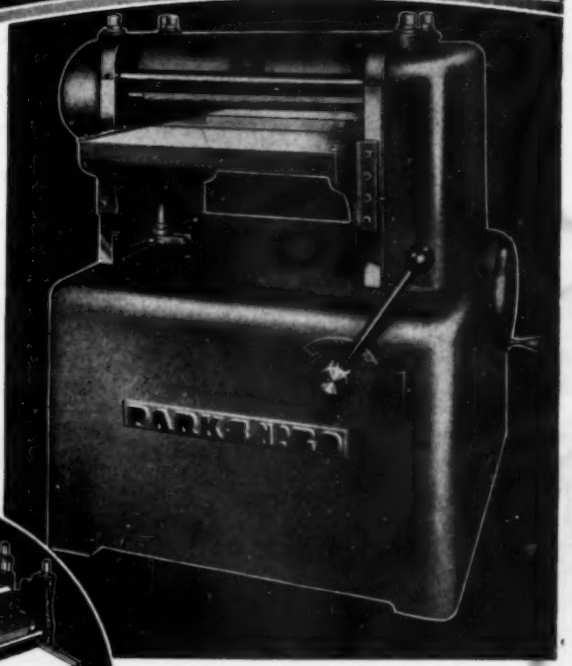
Inserts Used in Sandwich Panels

A typical application of Heli-Coil thread inserts using the roughing-tap method is their use in U. S. Plywood Corporation's insulated sandwich panels. These panels, used as wall members for army arctic huts, are made of honeycombed corrugated paper, laminated plywood and sheet aluminum. Corrugated paper, the internal insulating element, is strengthened by cross-grained laminated-plywood edge stiffeners. The entire element is sandwiched between two 1/32-in. aluminum sheets.

Assembly of the huts is facilitated by the installation of thread inserts as hidden nuts in the ends of each panel. These inserts are positioned in the plywood edges in such a manner that their axes are parallel with the length of the panel. Adjacent panels, assembled at right angles to each other, are fastened together with standard bolts through clearance holes in their 2-in. widths, see Fig. 1.

In addition to their use in fastening panels together, thread inserts are also used to fasten support brackets and

PARKS PLANERS



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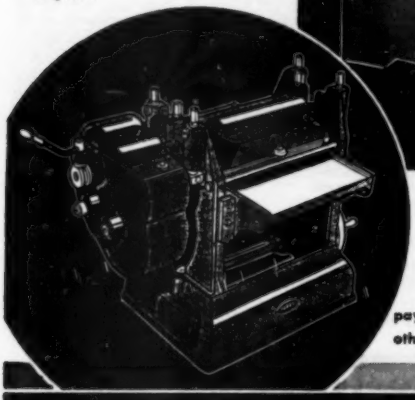

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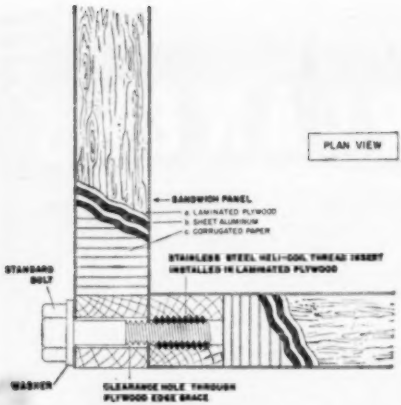

Fig. 1—Insulated wall panels for army arctic huts are fastened together with bolts screwed into stainless steel Heli-Coil thread inserts. These threads are installed in the laminated plywood edges of the panels as an assembly detail.

equipment to the faces of these panels. If the equipment is to be fastened to a panel face near an edge, the thread insert can be cut into the plywood supporting members. If it is to be installed elsewhere, a wooden block is installed inside the panel in such a position that it will be ready to receive the thread insert after the panel is laminated. In either case, installation of the Heli-Coil is an assembly detail.

An installation of the first type is shown in Fig. 2. Here, a stainless steel insert has been installed in the laminated-plywood corner section of a sandwich panel. This insert will allow equipment to be fastened to the wall with a standard ½-13 bolt.

Installation of this ½-13 thread insert requires the following steps: (a) The position of the hole is laid out; (b) a ½-in. drill is used to bring the hole to necessary size for the tapping operation; (c) the hole is tapped with

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a rough tap, putting threads in the hole that will match the external threads on the insert; and (d) the insert is installed with a special inserting tool. The inside diameter of the insert provides the necessary ½-13 female threads.

Another application of helical-wire thread inserts is their use as concealed thread elements in the assembly of portable army kitchens. Here, thread inserts are used to fasten wall panels to the wooden floor sections. The fastener, a standard bolt, extends through the wall panels from the outside and engages an insert previously installed in the wooden floor edging.

Strength Considerations

The second critical factor, the strength of the wood in question, must be considered in light of intended loads, direction of grain, dryness, space limitations, and related attributes. Independent laboratory tests have been used

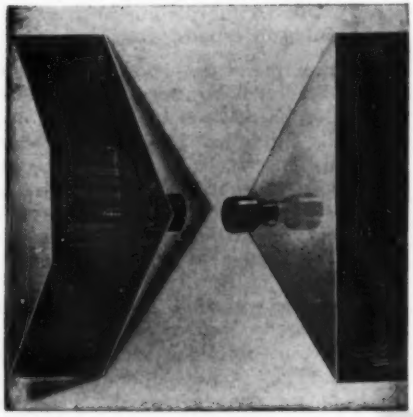

Fig. 2—Cut-away views of this prefabricated wall panel show how a ½-13 stainless steel Heli-Coil thread insert provides a wear-resistant thread for the attachment of support brackets and equipment.

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to give reliable information on strengths of receiving threads in wood.

For example, tests made by the Pittsburgh Testing Laboratory for the Heli-Coil Corporation, Long Island City, N. Y., on strengths of receiving threads for ¼-20 inserts in 1.030-in. diameter hard maple dowels show that a ¾-in. finish-tapped engagement (13½ wooden receiving threads) can sustain loads up to 950 lb. The same length of engagement in a rough-tapped hole (14 threads) can withstand loads up to 1760 lb. Failures in each case resulted from strippage of these wooden receiving threads. These results show that in this wood the rough-tapped receiving threads are 85% stronger than finish-tapped threads of the same specifications.

Similar tests on finish-tapped wooden threads for ¼-20 inserts having a 1-in. engagement (20 threads) showed that these wooden threads can take loads up to 1265 lb. before stripping. Rough-tapped threads of the same size (19 threads) can withstand loads up to 2260 lb., or an increase of over 78%. Results on 1¼-in. engagements in finish and rough-tapped holes for ¼-20 inserts show load values of 1500 and 2710 lb., respectively, or an 80% greater loading strength for the latter.

Another series of tests on receiving threads in hard maple dowels for ⅜-16 thread inserts show that with a 1⅛-in. thread engagement, loads up to 2265 lb. could be safely taken by the 16½ finish-tapped threads available. In contrast to this, is the 3360 lb. load that the 17½ rough-tapped threads can withstand. In this case, the increase in loading strength attributable to rough tapping amounts to over 48% of the strength of the finish-tapped hole.

Thread engagements of 1⅞ in. on

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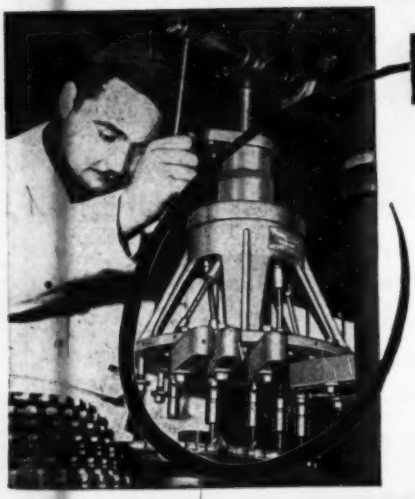

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these same ⅜-16 insert applications give loading strengths of 3680 lb. for 30 finish-tapped threads and 4700 lb. for 28½ rough-tapped threads, or an increase of 27% over the finish-tapped thread. Tests on 1½-in. engagements for this size insert were not valid since one of the dowels used in this test split during loading. Numerical and graphical comparisons of these values are presented in the table.

Summary

Although some precautions must be taken, threads having high wear resistance and loading strengths can be achieved in wooden members if helical-wire thread inserts are used. For optimum results, each application should be considered on its own merits. When factors are properly considered, installation of these inserts can be fast, easy, and economical.

Tests indicate that, in general, high-strength wooden receiving threads can be made if the following rule is observed: Optimum receiving threads in medium-hard and hard wood can be obtained with roughing taps. If the wood under consideration is extra-hard, the chance of making satisfactory threads with finishing taps is increased. Conversely, if the wood being considered is extremely soft, the possibility of making satisfactory threads without tapping is increased.

The End

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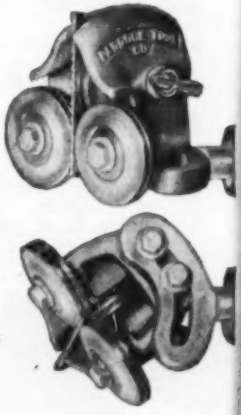

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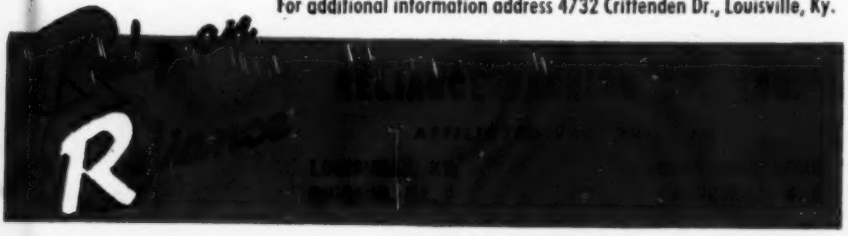


WWD Finishing Section

Improved COATED ABRASIVES

FOR THE WOODWORKING INDUSTRY

by E. E. Cathout
Behr-Manning Corporation, Troy, N. Y.

IF one could compare the machine sanding room in a modern furniture plant, with a similar room in the same factory a little more than a decade ago, he would no doubt be surprised at the many apparent changes that have taken place.

In today's sanding room, his eye would probably first note the difference in the machines being used on the various sanding operations as the speed of sanding with a relative increase in production would be most apparent. The machines themselves, streamlined efficient machines, such as triple drum sanders and high speed double and reversible belt sanders, would demand immediate interest and admiration. The over-all room layout, in the interest of straight line production, with, in some instances, conveyor systems, for the continuous movement of the various parts being manufactured, would explain in some part the efficiency with which the finished furniture was being made.

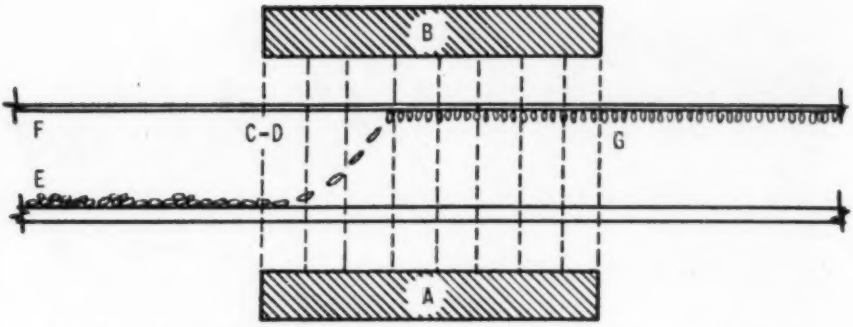
The speed of this conveyor system would be slowed down considerably without today's modern sanding equipment as designed by the several machine manufacturers, and the machines themselves would be impossible to operate at their relatively high speeds, if the improved technical coated abrasive of the present day was not available for use.

The coated abrasive industry points with pride to the many improvements made in its product and feels with at least some justification that these improvements have in a large measure been responsible for the modern sanding room of today.

The purpose of this paper is to review the more recent developments in coated abrasives in order that their greater efficiency be better understood.

Openkote Principle of Coating

One of the first major changes in the manufacture of coated abrasives or sandpaper, if you prefer, was the appli-



A. Negative Electrode

B. Positive Electrode

C-D. Lines of Electrical Force

E. Conveyor Belt carrying loose grain.

F. Paper: glue side down.

G. Abrasive Grain imbedded vertically in glued surface.

Diagram showing the principle of electrostatic coating.

cation of the "Openkote" principle of coating grain on paper, cloth or combined paper and cloth or fibre. This change was important as the "Openkote" principle makes it possible to control the distribution of the abrasive grains on the backing.

This sounds relatively unimportant until consideration is given to the fact that an efficient piece of sandpaper remains a good cutting tool only as long as the grain is exposed to the work for the purpose of sanding.

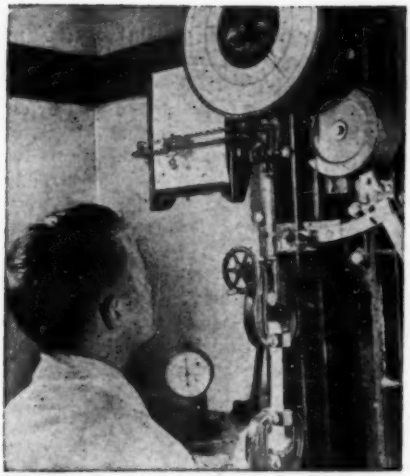
The principle of the "Openkote" method of manufacturing abrasive materials is to provide the space between grains required as chip clearance for the accumulation of the normal residue or waste caused by sanding, thus leaving the grain exposed and free for further cutting. The importance of such chip clearance is readily apparent to the average workman sanding fillers, paints, varnish, etc. Either by hand or with the more modern and productive reciprocating types of sanders in use today. His coated abrasive continues to cut in a normal manner as the waste accumulates between the grains in the spaces purposely provided by the "Openkote" principle of coating.

The "Closekote" method of coating produces a more closely packed abrasive surface as required on jobs where pressure and stock removal are factors, such as drum sanding and flat belt sanding. On the majority of such operations, the material being sanded is dry and chip clearance is not a major factor as the pressure used causes each individual grain to act as a cutting tool, which shears off dry particles that fail to load the coated abrasive and are drawn off in the dust suction system.

When soft gummy woods or similar substances are sanded on such equipment "Openkote" coated abrasives are available for use.

Development of Paper Stock Backing

Sanding costs in furniture plants have been considerably reduced by the sub-



Testing paper for tensile strength.

stitution of paper backed coated abrasives for the more expensive cloth back type formerly used.

This substitution has been made possible by the constant research and development work of the coated abrasive industry to produce a cylinder stock paper with sufficient tensile strength for the intended sanding operation.

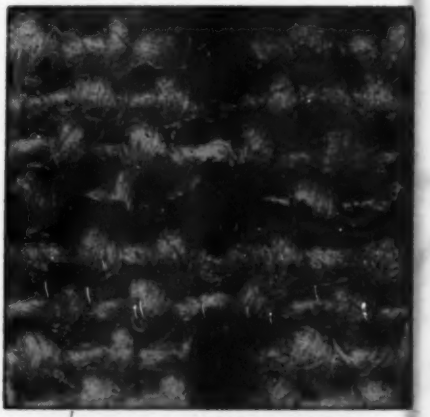
The average drum sander or flat belt sander utilizes rope cylinder paper most advantageously and with considerable economy in the furniture factory of today. Research work on paper development has included not only the strengthening of the paper, but also the perfection of surface for coating and the introduction of means for producing abrasive papers that lie flat when in use without the tendency to curl, peel or crack.

Improvement in Cloth Backings

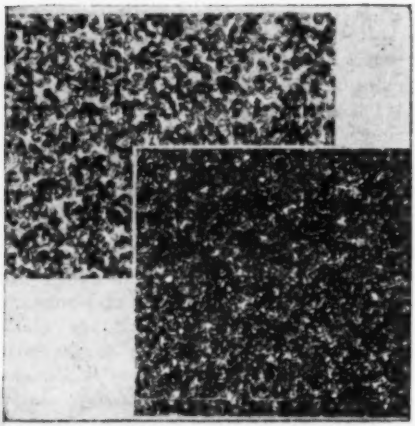
The several types of cloth used in the manufacture of coated abrasives have undergone many changes in recent years, both as to the construction and the processing prior to coating. These materials generally known as drills, jeans, finishing cloth and sheeting are all purchased as gray goods and require finishing to technical specifications, before they can be used in the manufacture of coated abrasives.

These finishing operations consist, in general, of bleaching, shrinking, dyeing and filling both the front and the back side of the cloth all to pre-determined technical specifications. All materials are straightened to a point where the threads are even and parallel in a tentering machine especially designed for this operation. These even and parallel threads are a necessity if the cloth backed coated abrasive is to be torn evenly into belts of various widths as in the case of molding cloth.

The introduction of more efficient mechanical molding sanders accelerated the development of abrasive cloths with the proper flexibility, as required to sand the different contours of moldings. Considerable research work has been done on this aspect of coated abrasives, resulting in the availability of, material that is unflexed, as used on disc sanders, single-flexed for belt sanding of flat work, and double and triple flexed as required to belt sand the intri-



Photomicrograph of "X" weight drill cloth with two threads dyed black to trace the "over one, under two" weave and to show the large size lengthwise thread.



Illustrating difference between "Openkote" and "Closekote." Note space for chip clearance and waste accumulation provided by "Openkote" method of coating.

cate shapes and contours of the modern furniture of today.

All fiexing operations are of a technical nature and require considerable "know how" as overflexing is generally detrimental to the productive capabilities of any piece of coated abrasive.

Additional Improvements

The garnet grain used in the manufacture of coating abrasives is the same lovely mineral of exquisite jewelry. In its natural state as mined in the Adirondack mountains, it is red and ideally suited to the manufacture of sandpaper because of its inherent sharpness and normal type of elongated fracture under pressure. It is, however, necessary to improve the ruggedness of garnet grain to prevent the mineral breaking down prematurely when used as an abrasive. This is done by a heat treating process whereby the mineral's toughness or temper is improved to a great degree with a resultant increase in the productive life of garnet coated abrasives at higher machine speeds than were previously possible with unprocessed garnet grain.

Photomicrograph of aluminum oxide grain showing its massive chunky fracture.

Chunk of silicon carbide broken from "pig" produced in electric furnace. Note its many razor sharp edges.

The artificial minerals, aluminum oxide and silicon carbide, man made in electric furnaces for use as abrading agents have been constantly improved since they became available in commercial quantities during the early part of the 20th Century. Industry has benefited enormously by these improvements which have included not only the strengthening of these grains but also the control of their structure as to

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shape and type of fracture. In the woodworking field, aluminum oxide grain with its rugged, chunky structure is ideally suited to the average woodworking sanding operation especially when hard woods are being sanded on high speed equipment. This artificial mineral is coated on cloth, paper in various weights, combined cloth and paper and on straight fibre. In all cases, the type of grain fracture selected is in consideration of the sanding operation to be performed.

During recent years, the grading of all minerals used by the abrasive industry has been constantly studied. The importance of close particle tolerances has been recognized as essential to modern finish requirements, and coated abrasives are now manufactured in particle size ranges that are considered to be negligible.

Electrostatic Method of Coating

The greatest single improvement in the manufacture of coated abrasives during the past several years would appear to be the perfection of the electrostatic method of coating the grain on the backing. By this patented process, it is possible to control the position of each abrasive grain, together with the orientation or distribution of the entire mass of grain making up the surface of the coated abrasive item.

The process governing the electrostatic method of coating is relatively simple. It consists briefly of passing the abrasive particles between two highly charged electrodes of opposite electrical force. As the grain enters the field of electricity, it is charged by the nearest force which causes it to be immediately attracted to the opposite pole. The lines of electrical force between the two electrodes cause the particle to rise lengthwise and become imbedded in the abrasive coated backing which is also being passed between the electrodes.

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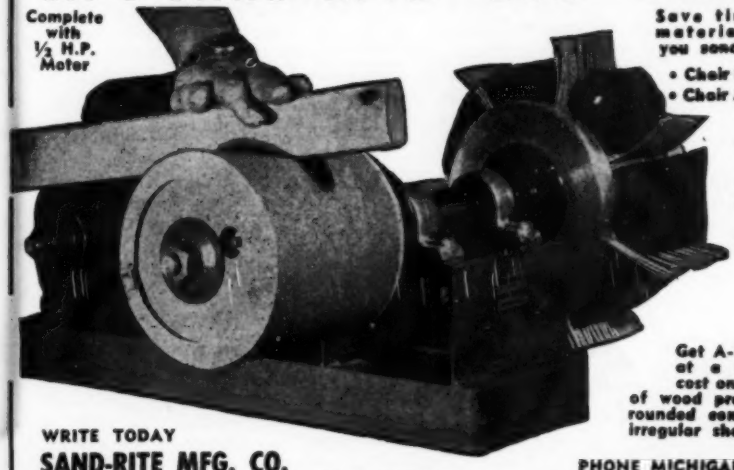

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Improved Bonding Agents

For many years the only accepted adhesive in the coated abrasive industry was high grade animal glue which contained the necessary bonding quality and the proper degree of flexibility, as required for use in manufacturing coated abrasives.

Heat, as generated on most sanding operations, has always been detrimental to the productivity of "glue bond" abrasives. The coated abrasive industry's constant search for suitable bonding materials, that would remain unaffected by heat, has been successful and today coated abrasives are manufactured with several types of adhesives in addition to glue bond.

The first of these new types was "durabonded" a patented process whereby the adhesive is made much harder and more heat resistant. This is accomplished by dispersing minute particles of inert, infusible, non-absorbent material of carefully controlled shapes and sizes throughout the adhesive itself.

Meanwhile, experiments proved the feasibility of using certain types of resins as adhesives, because they held all the necessary qualities required, namely bonding strength, resistance to heat, and flexibility. Today, "durabonded," resin, and combination glue and resin bond abrasives are available with productive qualities that continue to amaze both the manufacturer and the user. They are the ideal cutting tool for use on the high speed sanding equipment being built by machine manufacturers for increased production.

Experimental work on bonding agents, grain, backings and coating methods

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are the daily routine of the technical division of the coated abrasive industry.

Their progress during the past few years has been unspectacular but constant. The improvement in their product has resulted in the building of a modern cutting tool that is far removed from the "sandpaper" available to wood and metalworking plants only a few short years ago. This new, technical tool has justly earned the more proper name, "coated abrasive."

The End

WOOD PRESERVATION STATISTICS

The American Wood-Preservers' Association has published a report "Preliminary Wood Preservation Statistics" for 1950 by Dr. Henry B. Steer. The figures for 1950 are based on reports from 267 plants representing more than 95 percent of the wood treating capacity in the United States. A final and more detailed report will be released later in the year.

Write the United States Forest Service, U. S. Dept. of Agriculture, Washington 25, D. C.

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What makes the SPRAY GUN SPRAY?

Part III

... BY PAUL H. GRAHAM

THUS FAR, we have covered the principal operating parts of the spray gun which combine to make the spray gun spray properly. There are, however, applications which have not been covered in any great detail as well as some attachments used with spray guns which have not been mentioned.

Spray Gun Attachments

A few of these additional attachments worthy of mention include: Air adjusting valves which are attached to the air inlet of the spray gun to provide a means for regulating atomizing pressure. Fluid cut-off valves which are attached to the fluid inlet of the gun to permit the gun to be detached from the hose for cleaning by shutting off the fluid at the gun. These valves sometimes have a clean-out feature which permits material to be blown back through an exhaust port if the gun becomes clogged. Air and fluid valves which are attached to compressing outfits, pressure tanks or other pieces of equipment to provide an outlet connection for the hose and some means for turning on or off air or fluid.

Fluid inlet extensions are used to bring air and fluid hose connections together at the handle of the gun. The air hose and fluid hose should never be wrapped tightly together, but they should be close together near the end of the spray handle. These fluid inlet extensions accomplish this easily with a bent tube fitting which extends down from the fluid connection in the back of the nozzle to clear the trigger and bends back to a point near the spray handle, to which it is anchored by a metal fitting.

Quick-change detachable connections, usually employing a bayonet-type joint which can be made or broken by a slight turn of wrist, prevent lost time in matching threaded connections and tightening couplings. These are available for both air and material supply lines in standard air or material hose sizes, with standard threads to fit standard fittings, spray guns and spraying equipment.

Adapter connections are also available, male on one end and female on the other, used to convert connections on hose and equipment from one thread size to another. There are also couplings, male on both ends, used to couple two lengths of hose together, or to convert a female connection of one size thread to a male connection of another thread.

To insure clean work, fluid strainers have been designed for attaching to the fluid inlet of the spray gun to prevent dirt or other foreign matter from entering the fluid passages and being deposited on the work. Filters and traps in the compressed air lines per-

form a similar function for the air supply.

Features Important in Selection

What are the features to be looked for in the selection of the proper spray gun? Consistently better results are obtained with the type of spray gun which uses low pressure at the nozzle because it gives greater covering capacity, lowers operating cost, creates less spray mist, fumes or overspray, and controls the volatile removal tendency.

Specifically the features that should be looked for in a spray gun, regardless of the particles spraying operation, or kind of material or work to be sprayed are:

1. A uniform spray with minimum overspray and no dry spots, splitting or dark centers.
2. Does not clog easily.
3. Designed with few parts in direct contact with liquid, and has those parts easily accessible and easy to clean.
4. A strong rugged construction to hold up under hard constant use.
5. Complete control of both liquid and air, with ease of regulation of both.
6. Interchangeable parts—easy to obtain and inexpensive to stock.
7. A simple mechanism. The simpler it is, the less trouble there will be.
8. Proper balance and easy grip, so as not to tire the hand, wrist and arm.
9. Nozzles that can be readily and accurately adjusted, not too sensitive or delicate.

The older types of suction-feed and gravity-feed material containers, used to supply material to the spray gun, have been largely replaced by modern pressure-feed tanks, equipped with mechanical agitators and adequate pressure-control devices, in most production spraying operations. Using the pressure-feed system, the spraying speed of the operator is limited only by his personal skill, tank pressure on the fluid material, and the size of the fluid tip nozzle. He can use the spray gun to spray at any angle and even heavy bodied or high viscosity materials present no problem.

Improper adjustments of the spray gun will show up immediately in the spray pattern, so it pays to study spray patterns when making these adjustments. Generally speaking, when the atomizing air pressure is too high, the center of the spray pattern will spread or thin out the center, or will present a powdered effect with quick-drying materials like lacquer. Insufficient air pressure will usually produce a spattered or orange peel effect over the pattern.

A distorted pattern is sometimes caused by either an air cap or fluid tip obstruction. This can be tested by moving the cap about a half turn and spraying another pattern. When the defect turns with the cap, the fault lies in the air cap. If it remains in the same position, the obstruction is usually in the fluid tip. To trace the obstruction in either case, bear in mind the fact that the obstruction will usually come from the heavy end of the distorted pattern, because the free or open end of the air cap or fluid tip will direct most of the material over to the clogged side.

The chief adjustments at the spray gun are the fluid needle adjustment and the spreader adjustment, whose functions were previously described. Although the original purpose of the fluid needle adjustment was to restrict the pull of the trigger and to limit the flow of fluid material through the gun, this adjustment places a strong tension on the trigger that is bound to tire the operator during the course of a day's work. The limiting of the fluid needle travel also causes excessive wear on the fluid needle and fluid tip.

Testing Before Using

Where the pressure-feed system is used, fluid flow control at the gun is

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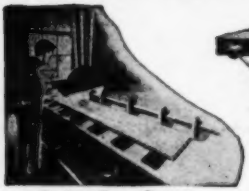

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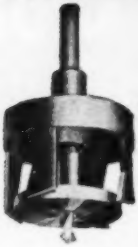

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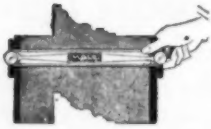

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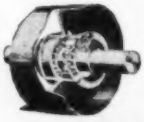
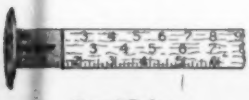


Ball Bearing Loose Pulleys

Picket Pointer



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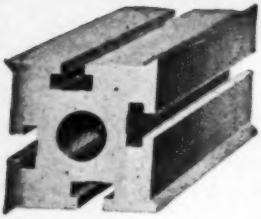

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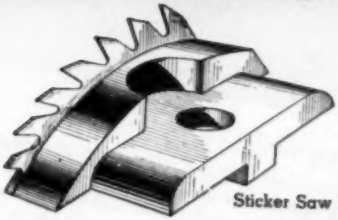
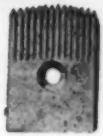


Sticker Saw Heads



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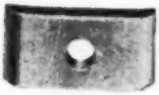
Matcher Bits

Balance Scale



Sticker Caps

Molders Gauge

Milled Knives

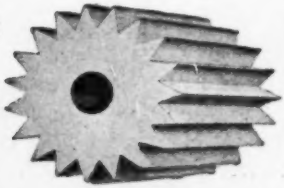
Coping Knives

Moulding Knives

Planer Knives

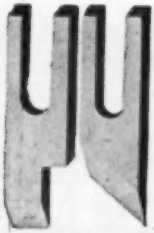
Thin Knives

Shaper Steel

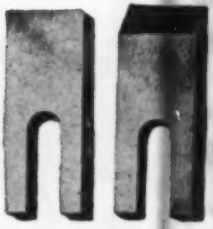


Steel Rolls

Tenoning Knives



Rabbet Blanks



Blanks

5 new DE WALTs

1 The NEW DE WALT "400"
7 power-fed machines in one: rip, bevel rip, plough, straight or bevel rabbet, tongue and groove, single head moulder and single head shaper. *Plus* the finest radial arm saw available—DE WALT GE or GR, 2 H.P. to 7½ H.P. *Plus* a special custom table top.

2 The NEW DE WALT "350"
The same 7 power fed machines as above and the same fine radial saw. Custom table top not included.

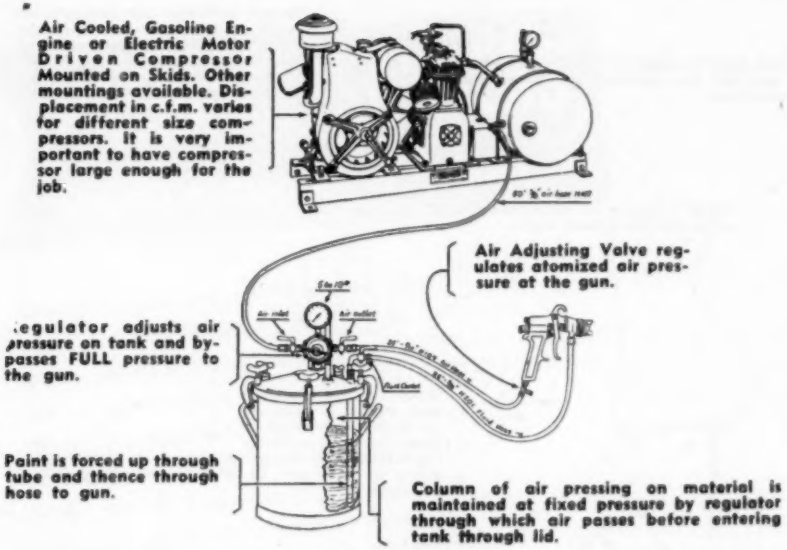
3 The NEW DE WALT MODEL R-2
The latest and finest receding arm Radial Machine ever exhibited, with new extra capacity motor, 2 H.P. to 5 H.P.

4 The NEW DE WALT AUTOMATIC CUT-OFF MACHINE
—for wood, plywood, metal, plastics and composition material.

5 The DE WALT POWER SHOP
The ideal machine for light cutting. ½ H.P., ¾ H.P., and 1 H.P.

See *all* of these outstanding DE WALT models. Whatever your cutting need there is a DE WALT *made* to do your cutting faster . . . more accurately . . . with greater safety. Write for complete information. DE WALT, Inc. Dept. WD-7 Fountain Ave., Lancaster, Pa.

DE WALT INC.


Air Cooled, Gasoline Engine or Electric Motor Driven Compressor Mounted on Skids. Other mountings available. Displacement in c.f.m. varies for different size compressors. It is very important to have compressor large enough for the job.
Air Adjusting Valve regulates atomized air pressure at the gun.
Regulator adjusts air pressure on tank and bypasses FULL pressure to the gun.
Paint is forced up through tube and thence through hose to gun.
Column of air pressing on material is maintained at fixed pressure by regulator through which air passes before entering tank through lid.

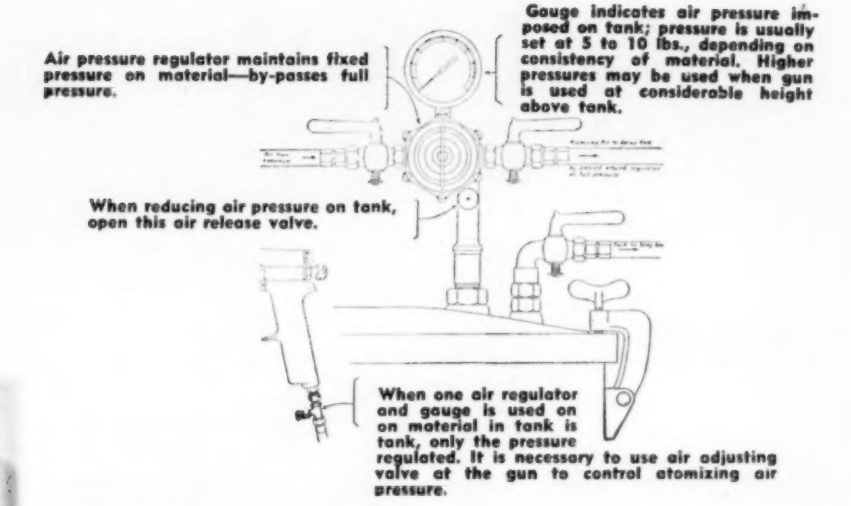
Equipment layout for pressure-feed spraying systems.

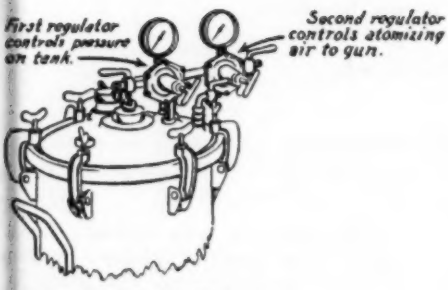
not generally used except where small amounts of material are used for touch-up and shading purposes. Otherwise the fluid needle adjustment is left open, with the control of fluid being made by nozzle size and fluid pressure adjustment at the pressure-feed material tank. This also takes the tension off the fluid needle and trigger to permit the operator to trigger his gun and feather his spraying stroke throughout a working day without undue fatigue.

The spreader or fan adjustment is opened wide at the start and adjusted to proper spray width after the proper relation of air to material balance has been reached. Contrary to the belief of many operators, this adjustment is not designed to control atomizing pressure. Atomizing pressure is properly controlled at the air transformer where the lowest possible pressure of air is released that will atomize the minimum amount of material needed for the particular spraying job.

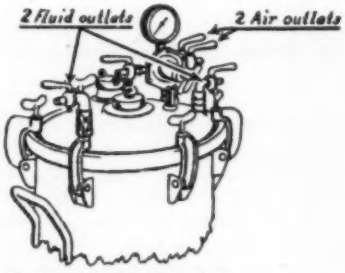
When spraying with pressure feed, sufficient air must be supplied to the nozzle to conform with the pressure at the material tank to produce desired results according to the size of the nozzle used. There are a number of methods used to establish proper spraying pressure. Probably one of the best methods in use today and surely one of the easiest to apply is the following method used by a well-known finishing engineer of considerable experience.

With a test panel placed in the proper position for spraying in the spray booth, atomizing pressure at the air regulator is set at about 52 lbs. and the fluid needle adjustment and the spreader adjustment are left wide open.


Air pressure regulator maintains fixed pressure on material—by-passes full pressure.
Gauge indicates air pressure imposed on tank; pressure is usually set at 5 to 10 lbs., depending on consistency of material. Higher pressures may be used when gun is used at considerable height above tank.
When reducing air pressure on tank, open this air release valve.
When one air regulator and gauge is used on tank, only the pressure on material in tank is regulated. It is necessary to use air adjusting valve at the gun to control atomizing air pressure.



Tank with Two Air Regulators and Two Air Pressure Gauges.



Tank with Two Air Outlets and Two Fluid Outlets for Two Spray Gun Operation.

Pressure feed tank regulators used to provide atomizing pressure and fluid control for spraying.

The spray operator begins to spray while the fluid pressure at the tank is increased until it reaches a point where he considers the flow of material is sufficient for the work to be sprayed. The pressure gauge registration is noted at this point. The pressure is then further increased until the operator advises the flow of material has started to interfere with the spraying efficiency of the gun. This pressure is also noted and the fluid pressure is set midway between the two pressure readings.

Air or atomizing pressure is regulated next. The pressure at the air

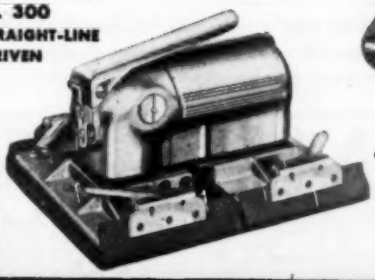
NATIONAL SANDERS

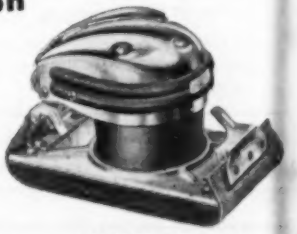
Speed Finishing Room Production

Whether you are rubbing the finish coat, padding in filler, sanding in the white or doing any one of many finishing operations, you will find National Sanders will speed the work and improve the finish. National offers both orbital and straight-line action machines in order to supply you with the type of equipment that will best fill your needs. See your National Distributor, or write us for descriptive literature.

Orbital or Straight-Line Action

MODEL 300
TWO-PAD STRAIGHT-LINE AIR DRIVEN





MODEL 400
ORBITAL ACTION — AIR-DRIVEN

NATIONAL NS SANDERS

NATIONAL AIR SANDER, INC.
2820 AUBURN ST., ROCKFORD, ILLINOIS

regulator is first lowered until the sprayed material is out of control, as evidenced by a spattered spray pattern. From this point pressure is gradually increased until the material is under complete control, manipulating the regulator until perfect control is reached.

This testing method can be used for the various materials as they are sprayed for different kinds of work and records made of these setting together with the best combinations of fluid tips and air caps for these spraying operations will save much time, increase spraying efficiency, and cut maintenance and material costs.

While they cannot be applied directly to every spraying operation, the following spraying pressures were charted for a modern conveyorized finishing system by this method:

Stain—atomizing pressure of 60 lbs. and fluid pressure of 14 lbs.

Washcoat (9% solids)—atomizing pressure of 60 lbs. and fluid pressure of 20 lbs.

Filler (oil base)—atomizing pressure of 60 lbs. and fluid pressure of 10 lbs.

Combination stain-filler — atomizing pressure of 35 lbs. and fluid pressure of 7 lbs.

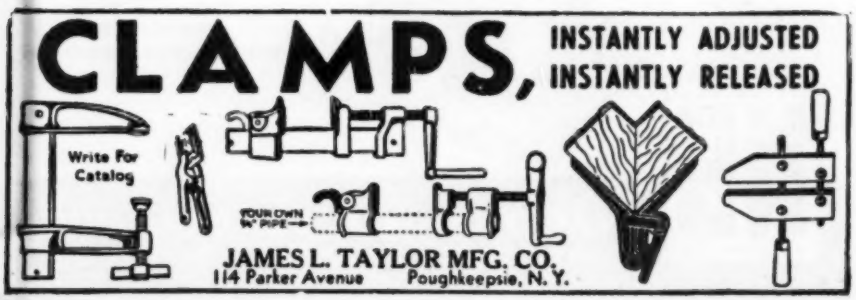
Lacquer (21% solids)—atomizing pressure of 55 lbs. and fluid pressure of 18 lbs.

Lacquer (26½% solids)—atomizing pressure of 55 lbs. and fluid pressure of 10 lbs.

After the spray gun has been carefully selected, it must be equipped with a large variety of interchangeable spray head combinations — air cap, fluid needle and fluid tip, designed to produce the desired results with the kind of materials to be sprayed, the type of material feed available, and the kind of surface to be sprayed.

This selection can be best determined by furnishing the spray equipment manufacturer with a complete history of present equipment and requirements. After it has been properly equipped to suit the material feed and particular spraying job, the spray gun must be properly adjusted and operated. Its working life must be insured by regular inspection, careful cleaning and maintenance. In the final analysis this is what makes the spray gun spray as it should.

Illustrations used throughout this article were furnished by the Binks Manufacturing Company, Chicago, Ill., and the DeVilbiss Company.



From record players

One of the world's largest manufacturers of radio phonographs uses Jewel Brand Garnet Abrasives to bring out the beauty in fine wooden cabinets faster, at less cost.

to play shoes

Jewel Brand Garnet Abrasive Belts shape wooden beach clogs at minimum cost, because they cut faster, last longer, don't "choke" like ordinary belts.

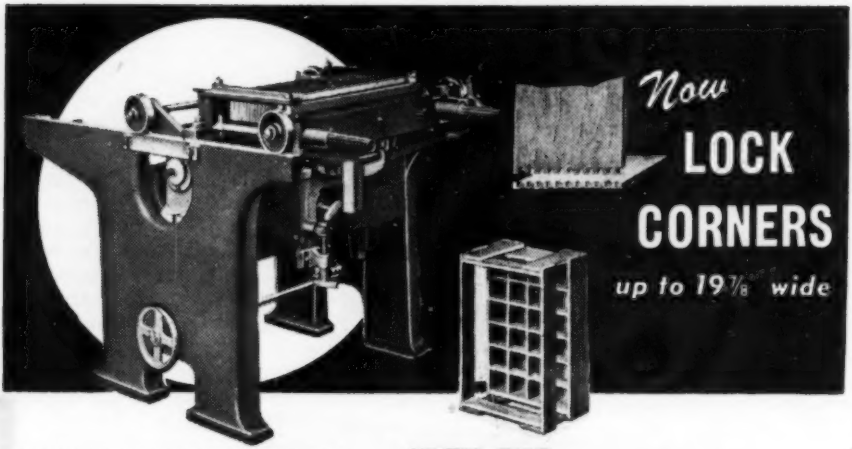
THERE'S A JEWEL BRAND COATED ABRASIVE to do every job, large or small, and to do that job *quicker, cleaner,* at *lower cost!*

Ask your distributor or write on business letterhead for catalog. Abrasive Products, Inc., 551 Pearl Street, South Braintree 85, Mass.

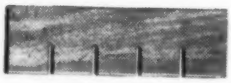
SHARPER, TOUGHER

Jewel COATED Abrasives

CUT COSTS!



Hopper feeding attachment will dado material up to 7" wide, 1" thick, 24⅜" long and 19⅜" between grooves. Illustration 3 below, shows dadoed stock used on carriage equipped with holder for dadoing stock longer than 22".



Standard carriage is used for lock cornering and grooving.

Standard carriage with hold-down is used for partially gaining stock and dadoing stock longer than 22" and up to 11⅝" wide.

WITH THE

DANCKAERT

Single End Lock Corner Machine

Here's the machine which can do every type of lock corner, grooving and dadoing needed to making a complete mineral water box, and every other type of box, shelving and drawers.

The Danckaert consists mainly of spindle which can carry circular profile cutters or saws up to a 10-inch diameter, with spacing collars and locking nut. A jointing attachment is furnished for jointing knives.

The wood is placed vertically in a ball-bearing carrier fitted with the necessary adjustable stops, or fed horizontally on the hopper principle. Hopper feed can be furnished at extra charge.

Send for Illustrated Circular

Supreme
Woodworking Machinery Co.
50-52 HOWARD STREET, NEW YORK 13, N.Y.

Craftsmen in Wood

By Douglas Dickins

Machinery and the need for high production rates have displaced the old-time wood carver. A few firms still employ professionals for fine carving on church furniture, etc. Whether the art can ever be revived in our country is questionable, but possibly this is our loss. When production quotas become the main criteria, hand labor such as this must be sacrificed.

THE DECLINE of craftsmanship is everywhere deplored, but there is one country at least where it is kept very much alive. Among the mountains of Switzerland, where the unhurried tempo of peasant life has not changed much through the centuries, there is time enough to acquire the skill of handicrafts, and leisure to appreciate the beauty of perfection.

A young peasant starts his training in the Cantonal Woodcarving school by copying lettering.

An art such as woodcarving is not only a source of satisfaction to the artist, but plays an important practical part in the economy of the dwellers in some of the Alpine valleys. In the long snowbound winter, when cattle ruminate in the dark warm stables, often built below the owner's chalet, some alternative employment and source of revenue is required by the country people. Woodcarving has traditionally filled this want, and the brown bears, eagles, ibex, cuckoo clocks, and other Swiss souvenirs known all over the world, have been created by the nimble fingers of peasant craftsmen.

The Bernese Oberland, the central Alpine massif, is the main center of this work, and at Brienz, a pretty little town at the eastern end of the lake of Brienz, there has been a modeling school since 1861. The present "Schnitzerschule," where these pictures were taken, was founded in 1884 by the Cantonal Government of Berne, which still provides the tuition—free, as is all Swiss education.

The course lasts three and a half years, and includes the study of anatomy, modeling with plasticine, and

After three years of training in the wood-carving school, Franz Trauffer can transform a wooden block into a lithe chamois.

sketching from nature, besides handling the tools of the trade. The boys, who start at about 15 or 16 years of age, generally live in the town with friends or relatives, but if they come from far off, they may receive a maintenance grant.

One of the instructors at the Swiss wood-carving school at Brienz uses a mallet and chisel to make a small model of a signpost. Signposts of this sort are often used in Switzerland, with the addition of the time in hours required for the particular journey on foot.

Made to order for a medical school, this massive wooden skull is sectioned and may be taken apart to demonstrate the internal structure of the skull. A highly skilled job such as this requires considerable knowledge of anatomy a subject included in the three-year curriculum.

The boys are seen in every stage of their training, from the early discipline of lettering, to the almost-qualified student who can make a good copy of an ibex. The school museum contains some superb examples of the work of outstanding students, including religious statues, and animals in which every

Typical of the chalets found in Brienz where the school is located. He works at a sunny window.

muscle is correctly depicted. Sometimes work is done to special order, as for instance church screens, or the enormous sectioned skull which was made for a medical school. Many towns in the Bernese Oberland signify their connection with the woodcarving industry by utilizing its products as signposts, embellished with quaint little figures—and most original and amusing these are.

INDUSTRIAL LIGHTING BOOKLET

Aimed at the industrial plant operator, this booklet stresses three ways that better lighting can work for him: it can cut cost by making possible increased production; increase efficiency by ensuring accuracy; and reduce accidents by clearly exposing dangerous operations.

The booklet emphasizes that different operations in a plant call for varying amounts and types of light, analyzes the three modern light sources as to type of light, efficiency, lamp life, maintenance, mounting height and job suitability.

For a copy write the Westinghouse Electric Corp., Dept. WD, Box 2099, Pittsburgh 30, Pa.

CONTROLLED MATERIALS PLAN

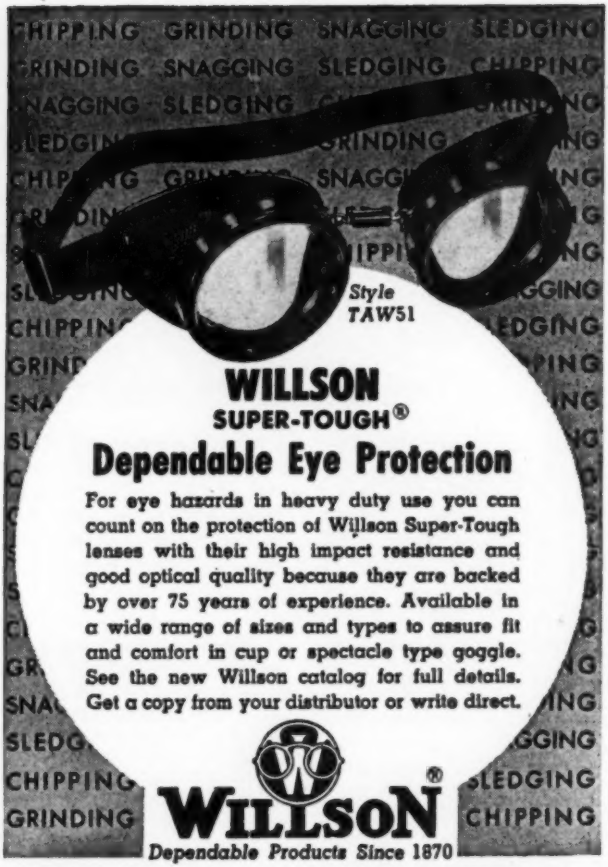
"ABC's of CMP" is the title of a booklet issued by the Dept. of Commerce to give background information and a short refresher course in the principles and operating procedures of the Controlled Materials Plan. Among the subjects covered in the booklet are CMP and the defense program, CMP defined, CMP fundamentals, industry's role in CMP, product classification, principle regulations, NPA industry divisions and CMP materials.

For a copy write the U. S. Dept. of Commerce, National Production Authority, Washington, D. C.

POWER TOOL CATALOG

The complete line of Walker-Turner woodworking machines and their accessories is described and illustrated in a 32-page catalog. Among the machines shown are band saws, radial saws, jig saws, table saws, jointers, lathes, drill presses, tilting arbor saws, belt and disc sanders. Special features and complete specifications are listed for each machine.

For a copy write the Walker-Turner Div., Dept. WD, Plainfield, N. J.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LEDGING
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For eye hazards in heavy duty use you can count on the protection of Willson Super-Tough lenses with their high impact resistance and good optical quality because they are backed by over 75 years of experience. Available in a wide range of sizes and types to assure fit and comfort in cup or spectacle type goggle. See the new Willson catalog for full details. Get a copy from your distributor or write direct.
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USING THE RIGHT LADDER?

The American Ladder Institute has printed a booklet entitled, "There's A Right Ladder For Every Job." The purpose of the pamphlet is to familiarize ladder users with the right ladder for the job; and to further educate them in the proper use, care and handling of ladders. Informative not only for those using ladders but also the distributional outlets serving the trade. Includes a reprint of an article "Facts and Figures" by Dr. L. J. Markwardt and Alan D. Freas of the United States Forest Product Laboratory.

Write the American Ladder Institute, Dept. WD, 666 Lake Shore Drive, Chicago 11, Ill.

SAFETY FENCE

An illustrated folder features the new safety fence manufactured by J. T. Lloyd, Bourse Building, Philadelphia 6, Pa. The safety fence, with combination cutter guard, circular guide and hold-down, can be used on shapers, drill presses, band saws and routers. Descriptions and complete specifications are included.

SUMMER

and *Safety*

IT seems that every season brings its special safety precautions. We find a whole stack of them to keep in mind during this time of year. Perhaps the first, since it involves people, materials and jobs, is the vacation period. As we receive formal notices that plants are closing for their annual two week vacations, we sometimes wonder if all of these plants will open again at the end of the vacation.

Each summer a number of manufacturers lose money, material and employees—if their vacation period is extended too long—because simple preventitive measures are not followed. Possibly the enthusiasm of a long-awaited vacation sends workers and management out of the plant not thinking or caring about the condition in which a plant is left. Fire is, of course, the number one enemy. Year after year we hear the same stories with different names and locations. Plants closed for vacation; repairs undertaken and somehow sprinkler systems get shut off with tragic losses to the owner when and if fire springs up.

Thinking management, foremen, etc. ought to see to it that things like flammable liquids, oily waste, etc. are disposed of and that the plant is left clean. With fewer people around, automatic protection is doubly important. Such automatic devices ought to be fully tested. Power ought to be available for fire pumps and other fire fighting equipment. Men who are going to make repairs, maintenance men or watchmen ought to be told just what protective systems are in use and how they work. Notify the city fire department that your plant is closed.

If repairs are being made in the factory, keep the repairmen aware of fire precautions. This applies particularly to cutting and welding jobs. Plant shutdowns can be safe if properly planned.

Next, what about all those people who are off on care-free vacations. Most of them want a job to come back to. Proper planning can help guarantee this. Secondly, comes their physical welfare. This, of course, should be their own responsibility, but because lost time due to sunburn, auto accidents, etc., costs you something too it might be worthwhile to put some good literature into their hands. The National Safety Council has some excellent pamphlets and posters which are well worth the price. The Council is located at 425 N. Michigan Ave., Chicago, Ill. Off-the-job safety, the Council believes,

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is partially management's responsibility too. Certainly management suffers for off-the- job accidents. Salt tablets in convenient locations and first aid kits readily available are other summer musts.

Just a reminder that the National Safety Congress is planned for October 8-12, in Chicago. Suggestions for subject matter to be discussed, etc. can be forwarded to Dan Adair at the National Safety Council.

Have a good vacation, but remember it's good to have a job to come home to, so play it safe.

A. O. PRESENTS NEW GOGGLE

Designed expressly to fit women or men with small features, goggle "800" Panoram Safety Goggle has quickly replaceable plastic lenses that give shatter-proof protection and clear, undistorted vision. Exceptional comfort is provided by a lightweight, attractive plastic frame conforming closely to forehead and face.

Eyecups combine protection with necessary ventilation and have unusually wide protective area and an extensive visual field laterally for the wearer.

A floating saddle-type bridge fits the nose comfortably with goggle weight distributed throughout eyecups; bridge is movable to prevent facial resistance. Center bar does not interfere with vision due to the unique design of the goggle.

Goggles may be purchased with green or clear lenses and green or clear frames. Both goggle sizes are supplied with a rubber headband in place of the former elastic.

For more information ask your nearest AO Branch for Bulletin S-1339.

ECA CERTIFICATE TO ENGIS EQUIPMENT COMPANY

One of the first Certificates of Cooperation of the Economic Cooperation Administration has been awarded to Engis Equipment Co., 431 South Dearborn St., Chicago, Ill. The text reads as follows: " . . . for furnishing technical assistance to the Peoples of the Marshall Plan Countries to aid them in

maintaining individual liberty, free institutions, and peace."

Widely known throughout the United States and Europe as exporters of woodworking equipment, Engis Equipment Co. were awarded this certificate as a token of gratitude for their services in assisting foreign visitors to become more intimately acquainted with American machinery and American methods of manufacturing.

EYE-SAVER

The Methaspec Eye-Saver is the newest plastic goggle development of the Watchemoket Optical Co., Inc., Providence, R. I. Designed to give workers the utmost in comfortable, correct-fitting eye protection, as well as complete safety, the new goggle has several features.

Adjustable Temple Length. The Methaspec goggle is equipped with retrax temples which can easily be adjusted. Simply by pushing or pulling each temple in or out, the wearer can adjust the temple length to suit his individual requirements.

Adjustable Lens Angle. To fit every face, lens angle may be adjusted by holding lens with one hand and moving temple (at hinge) up or down with other hand.

Reversible Bridge. For added comfort, the bridge of the Methaspec is thick on one side, thin on the other, and may be reversed so that either side touches wearer's nose.

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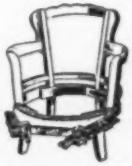
"HARTFORD" CLAMPS



Designed especially for barrel and irregular chair frames. Holds securely. Handled by one man.

Style 5: For interior woodworking, body building, furniture, sash and door manufacture. Rapid action tail piece. Quickly adjusted.

32 Clamp Styles Available. Write for free Catalog Today.

Used for gluing where triple clamping is required on irregular shapes.

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for production-line efficiency...

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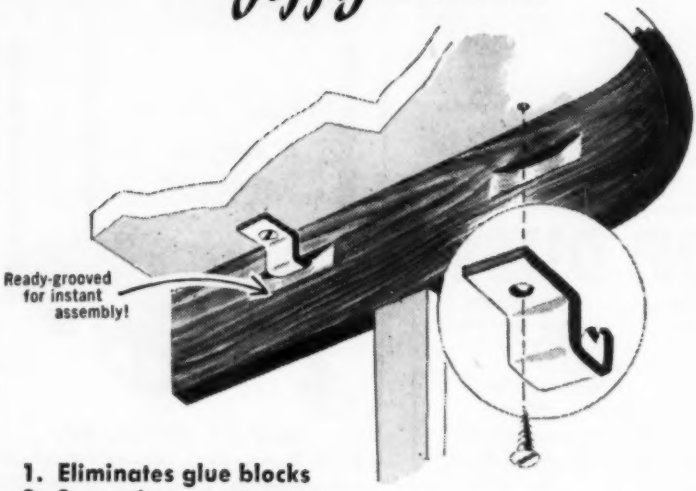
WITH OUR EXCLUSIVE NEW FEATURE:

THE *Jiffy-set* BRACKET



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2. **Saves time... cuts costs**
3. **Allows easy, speedy assembly!**
4. **Furnished free with order**

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NO MINIMUM QUANTITIES REQUIRED ON STOCK MOLDS!

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Foamed - Core PLYWOOD

by Thomas A. Dickinson

Foamed-core plywood, a comparatively recent development, is not as yet practical for very many applications. However, it is quite possible that in time it may be used in a number of ways where its thermal and acoustical properties will prove beneficial. High production cost is an obstacle at present for extended usage. **Editor.**

"FOAMED-CORE plywood" is a product that has been developed by the western aircraft industry in the course of a never-ending search for structural materials with more strength and less weight. As the name implies, it comprises a foamed-plastic core faced with wood veneers.

Plywood of this type may be as large as four inches thick, yet stronger and lighter than a conventional plywood panel which is only a half inch thick for each square foot of surface area. It is not likely to replace conventional plywood in any large number of current applications, since its production cost is comparatively high. Yet it could greatly increase the total number of applications for wood products, because it has a variety of unique qualifications in addition to high strength and low weight.

For example, it is an excellent thermal and acoustical insulator and could be used in place of various non-wood products in the construction of soundproof walls, refrigerator panels, etc.

Materials used in producing the cores include phenolformaldehyde, polystyrene, vinyl, cellulose-acetate, urea, and related resins which are chemically the same as the resinous adhesives used in laminating more conventional plywood products. These resins may be "cheapened" by compounding with special bulking agents such as sawdust and shredded-paper scraps while they are in the liquid state, after which they may be polymerized or solidified as porous foam materials by one or a combination of the following methods:

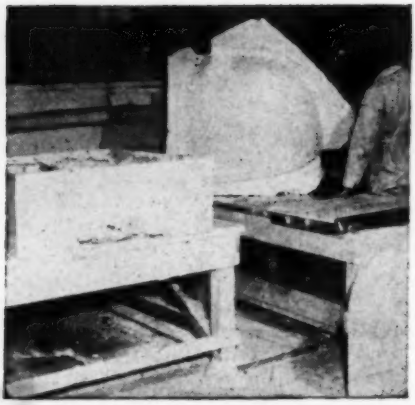
(1) Mixing with gas-producing agents, so that the materials will be forced to bubble as solidification takes place. For instance, metal powders have been added to acid-catalyzed phenolic casting resins so that the acid catalysts would react and produce bubbles with hydrogen gas as polymerization took place; similarly, mixtures of stearic acid and sodium bicarbonate have been used as "frothing agents" for molten thermoplastic compounds.

(2) Mechanically agitating the molds or retainers in which core materials are solidified, so that foam will be created by air bubbles.

(3) Heating the liquid mixture to higher-than-normal polymerization temperatures, so that the mix will bubble or boil like hot water as it solidifies.

(4) Permeating the resinous liquid with compressed air as solidification takes place.

(5) Adding volatile solvents which will increase the tendencies of the liquid to boil after heating.



Inexpensive plaster molds of the types shown here have been used in some cases to foam resin-core materials for plywood.

(6) Incorporating chemically - incompatible liquids such as heavy oils to the mixture. Fluids of the type in question will not solidify with the resin compounds, and can therefore be leeched from the latter so as to produce the desired porous structure after the resins are solidified.

(7) Using porous materials, such as expanded perlite or pre-foamed thermosetting plastics as fillers for the resinous liquids—which may then be solidified in a normal manner. Pre-foamed plastic resins are available as Strux cellulose-acetate products of E. I. du Pont de Nemours at Wilmington, Del.; elastomeric or synthetic-resin products of U. S. Rubber Co., New York City; Celltite products of Sponge Rubber Products Co., Shelton, Conn.; Styrofoam polystyrene products of Dow Chemical Co., Midland, Mich.; phenol-formaldehyde products of Marblette Corp., Long Island City, N.Y., and General Electric Co., Pittsfield, Mass. Expanded perlite (or "exploded" volcanic rock) is produced by Rheem Research Products, Inc., Phoenix, Ariz.

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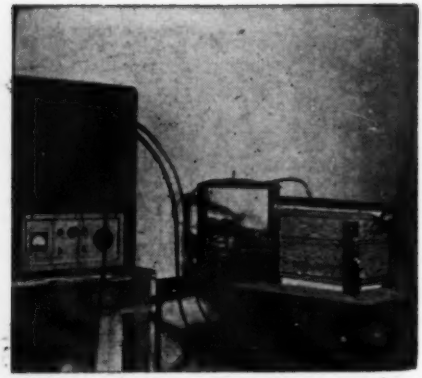


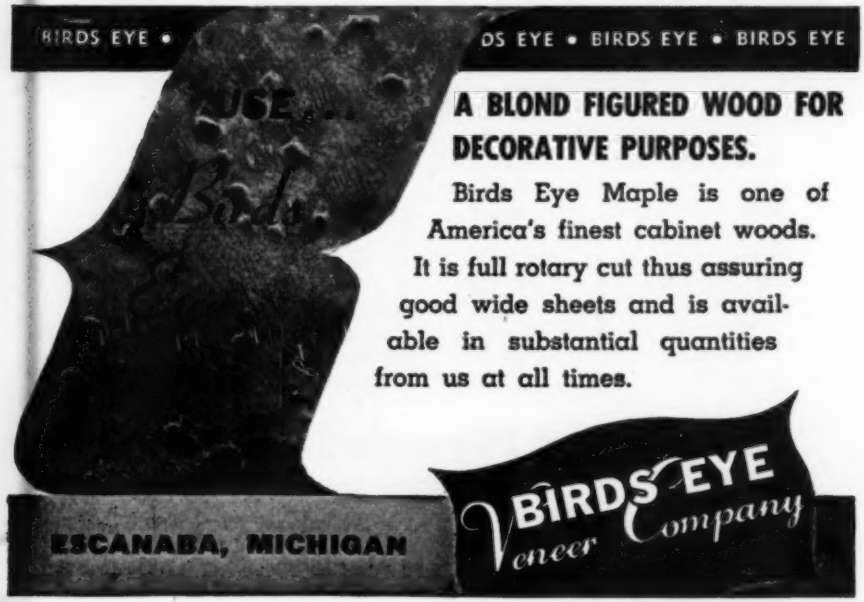
Dielectric heating setup of type used to assemble facing veneers and prefabricated plastic-oam cores.

through the use of filler materials alone, liquid core materials are solidified in completely-enclosed molds or cavities, dimensions of which limit the extent to which the materials will expand as they are foamed and solidified.

Sizes of the pores or bubbles in a solidified core material are dependent to a considerable extent on the amount of material loaded in a cavity prior to foaming, since a large load cannot expand as much as a small load in a given area. Plywood facing materials may be adhered to the cores either during or after the foaming process — depending on the circumstances.

As a rule, it is desirable to adhere facing veneers during the core-foaming process if the finished product should have contours or molded-in details; and, in some circumstances, this can be accomplished by shielding the cavity surfaces with veneers so that the core materials will serve as their own facing adhesives during the foaming process.

When the latter procedure is impractical (due to high frothing temperatures, the need for acid catalysts which might damage facing veneers, etc.), the usual practice is to coat the solidified cores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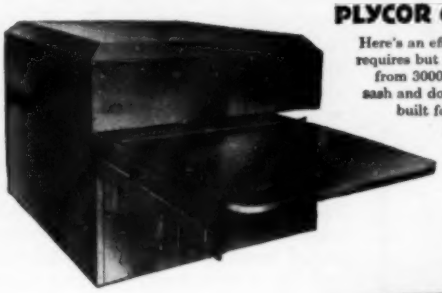

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with liquid-resin adhesives so that plywood sheets or individual facing veneers can be adhered thereto—with or without heat and pressure, depending on the nature of the adhesives and lamination materials in different circumstances — much the same as facing veneers would be glued to core materials in standard practice.

According to research workers at Consolidated Vultee Aircraft Corporation at San Diego, Calif., the special tooling and equipment required to produce foamed-core plywood is neither extensive nor expensive when compared with similar requirements for comparable production processes. For example, where only a small number of panels were required, suitable cavities for foaming core materials were made by casting plaster on standard wood patterns, respectively sealing and lubricating the plaster mold surfaces with coatings of clear lacquer and wax, and using non-corrosive metal sheet or plate to cover the cavity openings after the core materials were cast.

Metal foaming molds for much longer production runs have been similarly made by casting lead and lead alloys, since the latter are comparatively inert at most foaming temperatures and will not chemically react with standard foam materials — including even the acid-catalyzed phenolics.

Where it was necessary to adhere contoured cores and facing materials after the foaming process, workers at Douglas Aircraft Company of Santa Monica, Calif., have attained good results without large tooling expenditures by using wood form blocks shielded with metal electrodes to support and heat-cure the lamination materials by means of dielectric heating equipment.

At Boeing Aircraft Company, of Seattle, Wash., lamination materials loaded on special form blocks have been inserted in cellophane bags so that their

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alignment could be maintained for oven-curing purposes by evacuating air from the bags.

Foamed or expanded plastic core materials alone are not mechanically strong. For example, where an unfoamed phenolic casting resin might have more than 10,000 pounds per square inch compressive strength, a foamed phenolic core material will rarely have more than 100 pounds per square inch compressive strength.

. However, it should be noted that the mechanical strength of foamed-core plywood may be comparable to the strength of sheet-metal products—especially so, if weight and area factors are duly considered.

In other words, mechanical strength must be computed in terms of the thickness and composition of the facing materials alone because the value of the core materials is principally due to other qualities—such as reduced den-

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sity, increased buoyancy, and greatly-improved insulation properties.

The latter statement might sound somewhat optimistic if contemplated with the idea that "a chain is no stronger than its weakest link"; but here it should be recalled that forces exerted in pounds per square inch against the face of any laminate is relayed over a large area and in a more or less exhausted condition to the core.

There is no theoretical limit to the number of facing veneers that can be built up over a foamed resin core, but for most non-structural purposes one or two layers should be sufficient. In aircraft structural work, where maximum weight requirements are most essential, plywood faces with thickness of about ¼" are usually considered sufficient for cores which are 3" to 6" thick.

Outside of the aircraft industry, uses for foamed-core plywood are not yet extensive; but, in addition to the applications that have heretofore been suggested, it seems rather likely that these materials can play an important role in the manufacture of insulated housings (for electronic equipment, etc.) flotation equipment (such as boats and buoys), luggage, furniture, shipping containers, lightweight toys and many similar products

The End

PLEASE EXCUSE

Our error in reporting on the Ford Motor Company's woodworking operations which appeared in last month's WOOD WORKING DIGEST. On page 141 it is stated that the phenolic resins and catalysts are Durez Plastics and are obtained from the Snyder Chemical Corporation. The sentence should have read: "The phenolic resins and catalysts now in use are obtained from the Snyder Chemical Corporation and Durez Plastics."

PLYWOOD BUILT-INS

Any of our readers selling plywood direct to the home owner will be interested in this booklet. It describes a variety of ways in which the home owner can use plywood—storage units, free-standing breakfast bars and dining room partitions, ingenious closets for fingertip convenience, outdoor storage—designed to achieve added comfort and greater livability in every area of the house. Compiled in handy file format for ready reference, the 16 page portfolio contains more than 50 architectural drawings of indoor and outdoor built-ins offering new guideposts for better living.

Write the Douglas Fir Plywood Association, Dept. WD, Tacoma 2, Wash.

THE ABC's OF PLANING MILL LAYOUT

Of interest to all lumber producers is the publication of a paper entitled "The ABC's of Planing Mill Layout." This illustrated, 8-page brochure describes three basic lumber planing production lines, complete with their auxiliary handling and triming machines. The material offered suggests elementary methods of solving the basic problems of handling and is a condensation of the thoughts of many mill operators and engineers on the subject of simplifying planing and handling procedures to achieve straight-line production.

For a copy write the Stetson-Ross Machine Co., Dept. WD, Seattle 4, Wash.

NEW LOCATION

Skilsaw, Inc., manufacturers of portable power tools, announced the moving of Skilsaw's Los Angeles branch to a new location in the city. Formerly at 2645 S. Santa Fe Avenue, the branch is now at 2730 South Broadway, Los Angeles 7, occupying new modern quarters with a total floor space of 5500 square feet.

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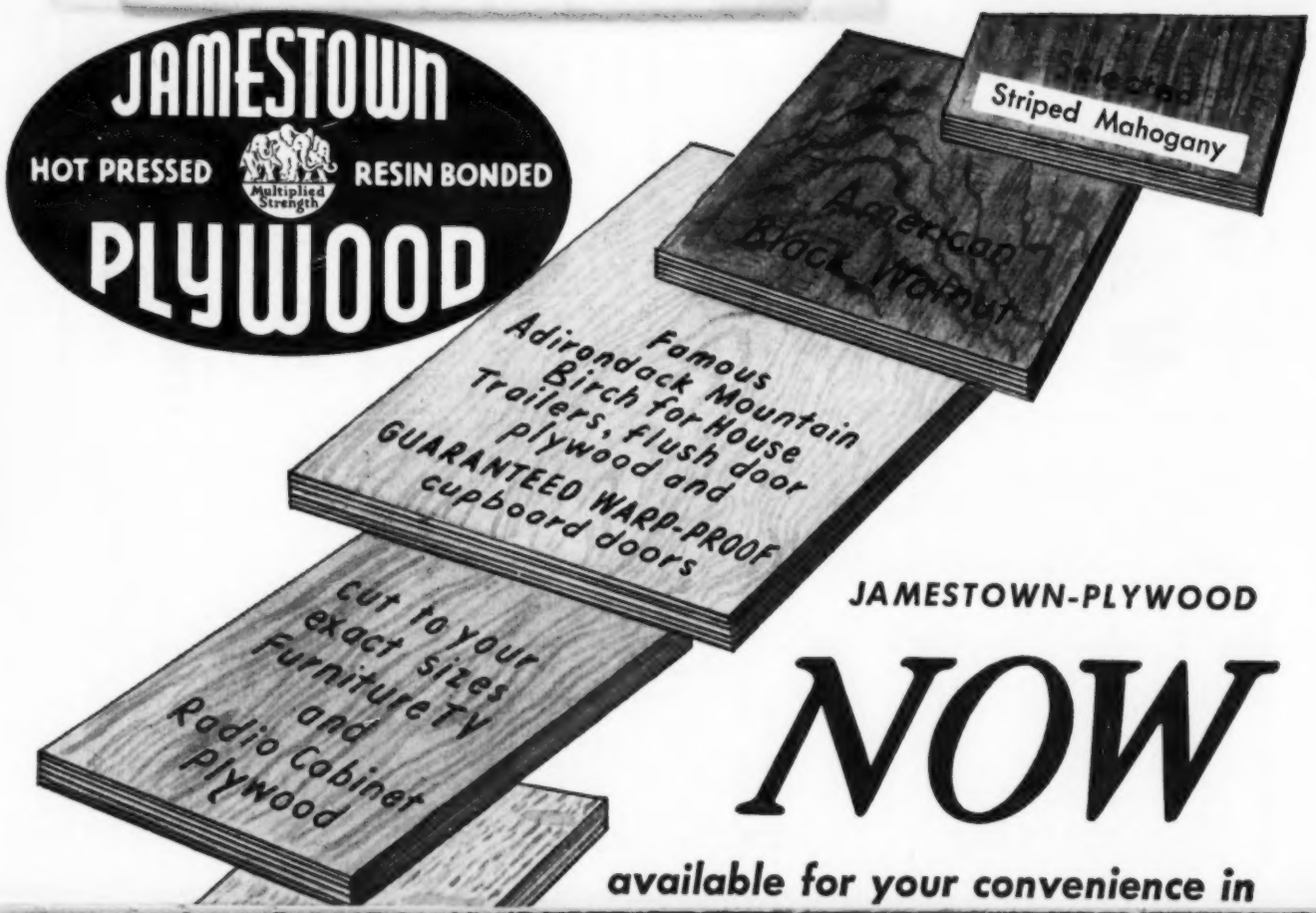
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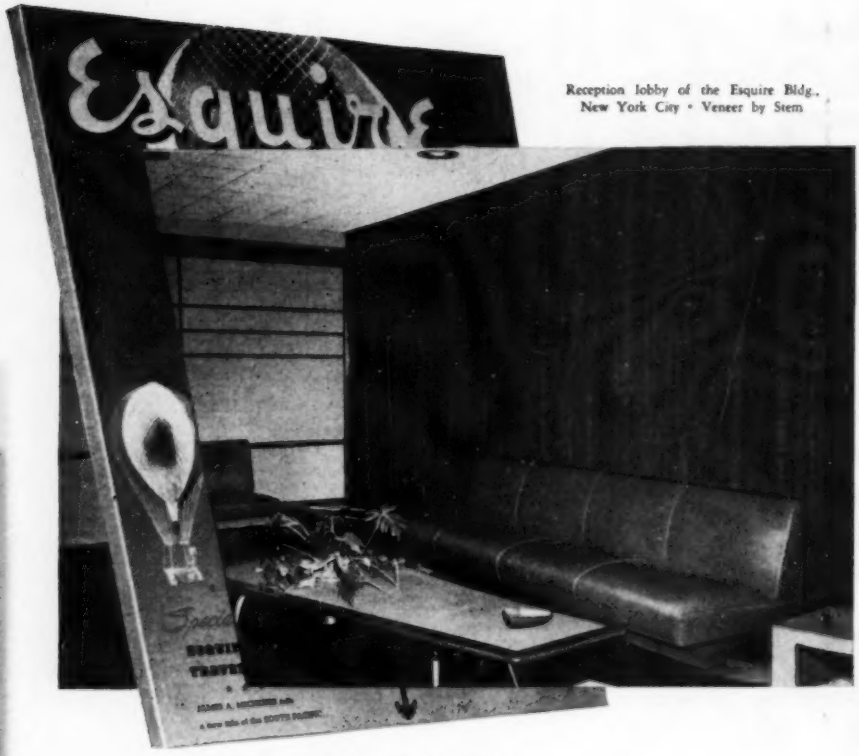

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The beautifully paneled wall of quartered walnut, in the above photograph, illustrates one of the many ways in which veneer may be used in modern architecture. The stark functionalism is enriched and softened, yet the feeling of the modern is heightened.

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VENEER and PLYWOOD

By Ned Bailey

Part 10

MANUFACTURING plywood and laminated wood has taken on greater importance as the needs for types of such material become more numerous and varied. The perfecting of new adhesives, gluing equipment and methods plus the preparation and treatment of veneer have broadened the uses of plywood so that today there does not seem to be any limit to what can be done with plywood.

I was talking to a manufacturer in Arkansas who is making pipe out of specially treated plywood for use in place of metal pipe now used for sewer pipe and sewer connections. This same concern is experimenting with plywood angle irons and plywood brackets in place of metal ones. These applications are still in the experimental stage but are proving themselves satisfactory to date.

To get to the more generally used plywood panel its manufacture consists of preparing the faces, the crossbands and cores; then edge-gluing the narrow pieces to form large sheets when required; then laying-up and the spreading of the adhesives; then pressing the glued lay-up into a panel; then drying the panel and finally finishing the panel.

Veneers to be used to make plywood should be dried to a very low moisture content and used at once. In case they are taken from storage they should be redryed before being glued. Platen driers, consisting of a series of smooth, flat, steam-heated platens are generally used for redrying. To allow the steam to escape, the platens of these driers automatically open and close, progressive type platen driers are rapidly coming into use in this country.

Veneers are usually dried or redried as the case may be down to five percent moisture content, or less if liquid glues are used. However, the moisture content of fragile veneers such as crotch and burl type should not be below ten percent.

When Tego film, or other similar film glue is used the moisture content of the veneer should be between 10 to 12 percent. This higher moisture content

is needed to insure an adequate flow of the resin during the bonding cycle.

After drying to the proper moisture content, the next operation consists of trimming the veneers to the dimensions slightly longer and wider than the finished product. With the less expensive face veneers, the rough ends and edges of core and crossbanding materials are most economically trimmed with a band saw or a circular saw and trimming a number of sheets of about one inch thickness, at one time. Veneer clippers are more in use for cutting the face and back veneers—and usually only one sheet is trimmed at a time.

Much judgement on the part of the operator is required to do a good job of clipping since the value of fancy face veneers depends largely on the figure they will produce. The face clipper must keep a number of classifications in mind such as the one piece face that consists of a single unmatched sheet of veneer, the width of this one piece face veneer, if sawn or sliced is regulated by the width of the flitch, which in the case of rotary cut veneer any width can be had.

Book-matching, sometimes called two-piece or center matched face, is made by splicing two pieces of veneer of equal width in such a manner that a bilaterally symetrical figure results. One sheet of veneer is, in this case, reversed in order to bring the corresponding part of the design together at the center. Then there are balanced joints which, as the name indicates, are veneers cut so that when two or more sections are joined they form a symmetrical figure. These contrast with random joints where the various pieces are used unbalanced for the figure. There are faces selected for color either light or dark the rest of the piece going into waste. Where lighter colored sapwood in the veneer sheet is allowed in face veneer it is called sap-no-defect.

For backs two grades are generally used,—sound back or veneer free from defect but not selected as to color or figure, and reject back for places that show in the finished product.

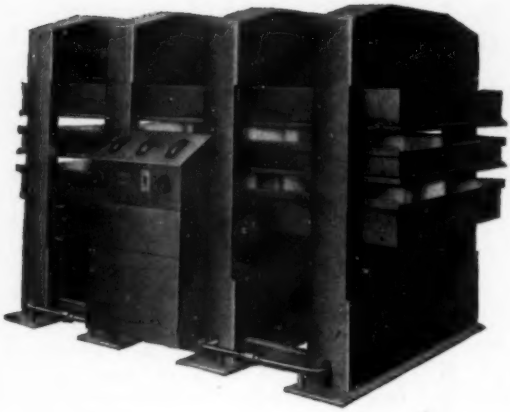
Next the clipped sheets of veneer are run through the edge jointer. This operation insures tight and imperceptible joints in the finished product. One to eight inch stacks are usually put through the edge jointer in one operation. The edge jointer is as a rule equipped with rapidly revolving traveling type cutterhead having up to as many as 16 knives. Cutting can be done all in one operation by using a combination of jointer and clipper cutting all four sides in one operation.

From the edge jointer the veneer goes to the matching table if they are to be used as face veneer. Here again much artistic ability, experience, patience and imagination are needed to get the best results. The operator doing this work is known as the matcher and when he selects two pieces of veneer he is going to join, he butts them firmly together along the dressed edges and holds them with either gummed tape or glue spread thinly along the joint. This is called splicing and machine splicers are rapidly taking over handwork.

The tape-splicer handles two sheets of veneer fed through a paired series of live rolls the shafts of which are angled so that the two pieces of veneer are butted firmly together as they travel across the table. From a roll of gummed tape suspended above the table a strip is passed over a moistening device and under the live rolls to the joint. The tape is set and dried by an electrically heated roll, which is pressed firmly against the veneers. Tape is made of either paper or cloth and is glued to the "finish side" of the sheet. During finishing operations this tape is sanded off the panel.

A more recent development, the tape-

the modern design



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less splicer makes possible the joining of individual sheets of veneer without the use of tape which eliminates, among other things, the necessity of sanding off the panels after their manufacture, and the tape cost is also eliminated. The tapeless splicer veneer is somewhat similar to the tape type, in one however, the edges to be joined are led over a glue spreader just in front of the heating rolls and in another the edges of the sheets are precoated with adhesive prior to joining. When fed into the machine the coated edges of the veneer pass over a formaldehyde wick or one with any other suitable moistening agent and are then bonded in the usual manner while passing through the heated pressure rolls.

Plywood cores are made of lumber, a single sheet of veneer or several sheets properly bonded together. Woods of good dimensional stability and moderately low density make the best core stock. Grain uniformity and ability to take glue are good qualities also, for example edge-grained stock rather than flat-grained. The most common specie for core stock are soft maple, sound wormy-chestnut, yellow poplar, red gum and the birches. Lumber core stock is usually dried to five percent moisture content, then surfaced and ripped into ¾ inch strips four inches wide. Major defects are removed at the resaw. The strips are glue spread on the edges and placed in a clamp or high frequency press and glued into panels. As lumber cores absorb a great deal of water during gluing they must be redried before being made into plywood panels.

Crossbands are used to equalize stresses in plywood, reducing warpage and dimensional changes as well as minimizing checking in thin faces when they are bent directly to a thick core.

The next operation is bonding the various elements together into one solid panel. To do this adhesive is spread on

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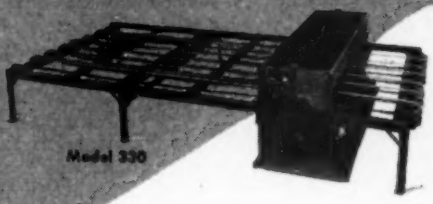
VENEER
MACHINERY



Model 330

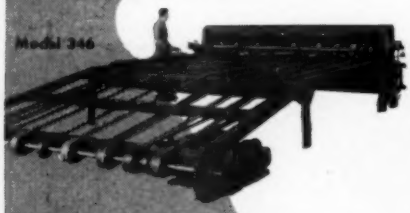
Economy of clipping operations is proportionate to the efficency of the clipping and handling equipment used.

Make sure your veneer handling and clipping equipment is delivering the highest quality and the maximum quantity of usable veneer with a minimum loss factor from lathe through clippers.

Coe veneer clippers are available in a variety of types to meet all clipping needs.

Consult us regarding your specific problems without obligation.

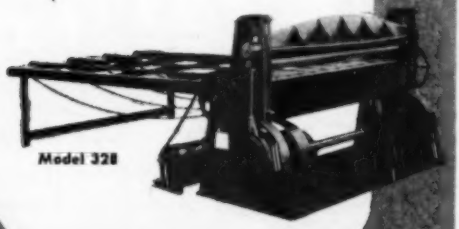
Model 346



Coe Model 330 Automatic Panel Clipper, Multiple Knife for sizing single sheets of veneer in motion. Position of cuts are selected by means of a timing chain moving at same speed as veneer.

Coe Model 346 Air-Operated High-Speed Single Knife Clipper for sizing single sheets of veneer in motion.

Coe Model 328 Motor Actuated Clipper for clipping multiple layers of veneer. High torque motors operate table and knife. A push button controls the feed plate and a floor switch operates the knife.



Model 328

The COE MFG. Company

360 BANK STREET • PAINESVILLE, OHIO

Lathes • Clippers • Dryers • Knife Grinders

the faces of the core, crossbands, etc., or interleaving the individual layers of wood, and for other material, with sheets of dry glue film or liquid adhesives then pressing them firmly together with or without heat, regulated by the glue to be cured. There are a wide variety of glue spreaders regulated by the type of glue and the method of lay-up of the plywood.

Glue spreaders in common use consist of two (power-driven) rollers each rotating in a bath of adhesive. These rollers are adjustable to accommodate veneers of various thickness. There is an adjustable pressure bar or doctor blade as it is called which controls the supply of adhesive to the rollers, any good spreading adhesive can be used in this or similar type spreaders. When passed through the spreader the veneer assembly setup is then placed in a press until cure of the adhesive has been affected.

For the manufacture of plywood and laminated wood there are a great many kinds of adhesives which will be described in another article. However, they must all have certain characteristics, they must be of such a nature that they spread easily and uniformly over large surfaces and must be compatible with extenders where they are used. Bonding ability should not diminish with age nor should they stain or disfigure face veneers. They must be proof against attack by insects, fungi and bacteria, and in many instances highly water resistant. All these qualifications do not come in any one adhesive that we know of but their selection can be made to fit the end use of the plywood or laminated wood.

At present the various types of adhesives breaks down into six classes used in plywood panel construction;—animal, starch, vegetable-protein, blood-albumin, casein and liquid fish

J. C. DEACON PLYWOOD Company

Plywood & Lumber

ESTABLISHED 1890
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CHICAGO 8, ILLINOIS

LET DEACON SAVE YOU STEPS!

For a stick or a carload . . . when you need plywood you can save steps simply by picking up your phone and calling VIrginia 7-7240. Maybe you need mahogany or walnut. Perhaps your plans call for knotty pine or Etch Wood. Or possibly you want Tanguile with the "million dollar" look . . . in any case you'll be delighted with the friendly service and the promptness with which your order is filled. You'll call soon, won't you?

glues and synthetic-resin adhesives. Adhesives have been treated in detail in a previous article. Presses for making plywood will be discussed in our next chapter.

The End.

STAMP EXCHANGE

A long time friend of WOOD WORKING DIGEST, C. K. Weil, was seriously injured in a tree felling accident and left paralyzed. Possibly some of our readers have known Mr. Weil and were aware of this tragic accident. Now Mr. Weil is working up a bedside stamp exchange for collectors.

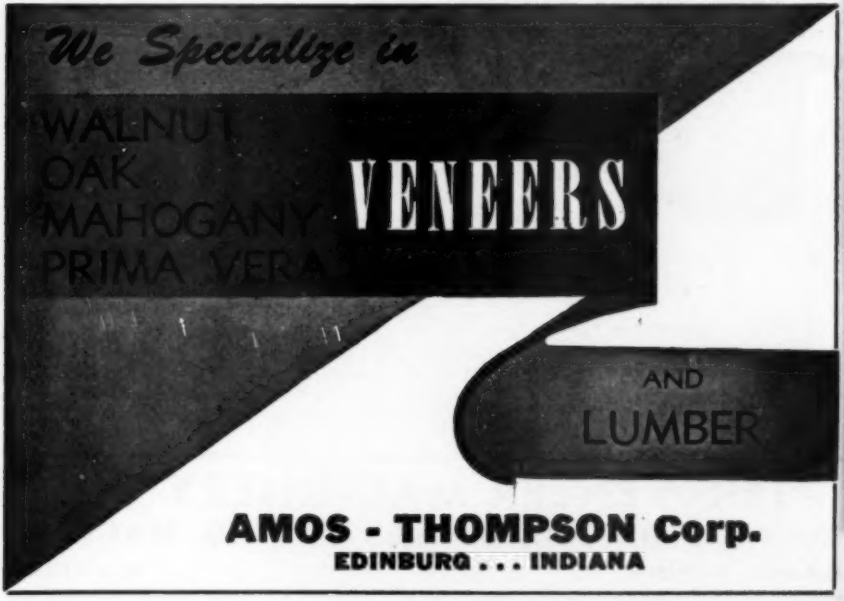
He is particularly eager to hear from readers who may have accumulations of stamps for sale. If you are a collector, or know of someone who is, perhaps you will want to write Mr. Weil at 1324 Jacksonville Ave., Bend, Ore.

NEW PLASTIC FINISH RESISTS WEAR AND CORROSION

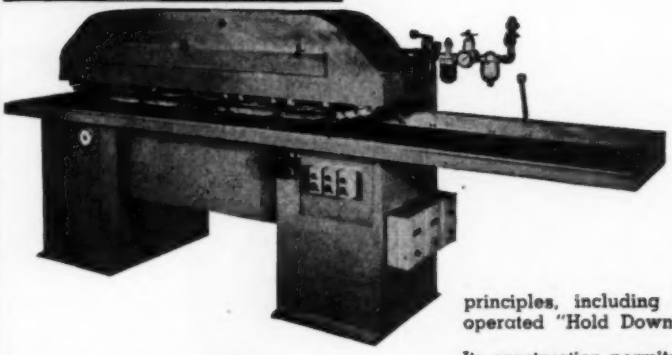
Platon, a new pure phenolic plastic finish for wood surfaces, with wear and corrosion resisting qualities claimed far superior to ordinary paints and varnishes, has just been announced by the Minnesota Platon Corporation of Pipestone, Minnesota.

According to the manufacturer, the new finish contains no oil or other deteriorating substances and consequently is alcohol and moisture proof, acid resistant, fire retardent and resistant to all the usual elements of corrosive wear. Surfaces finished with Platon will retain a high gloss for years and require no waxing or scrubbing.

We are told the material can be applied cold by brushes, sprayers or dipping processes, Platon becomes dust-free within 10 minutes, is tack-free within 30 minutes and dries within 4 hours to a glossy, non-slippery finish which will not chip, crack or peel.



WHY NOT TRY THE NEW CONTINUOUS FEED VENEER JOINTER



Our New Continuous Feed Veneer Jointer we believe is far superior to any continuous Feed Veneer Jointer heretofore made.

It has several revolutionary mechanical principles, including pneumatically operated "Hold Down" Shoes.

Its construction permits perfect work on extremely long stock, and it will joint successfully highly figured veneers such as burls, crotches, etc. The machine is equipped with a glue spreading attachment.

THE VENEER MACHINERY CO.

MAKERS OF THE DENNIS TAPING MACHINE

GRAND RAPIDS **MICHIGAN**

New High Frequency Bonding

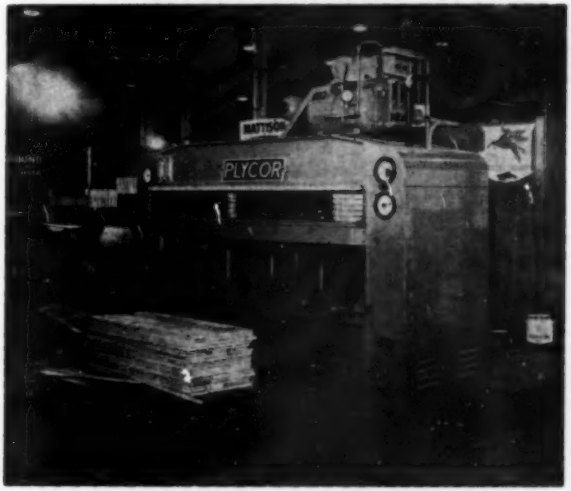
Among the many types of woodworking machinery shown at the recent Forest Products Exposition, two pieces of equipment indicated a trend toward increased efficiency in smaller plants. These two units are the Plycor one-man electrogluer and the Plycor type BVH hot press. Both of these machines were in operation at the exposition turning out finished work. They are offered to the industry by the Plycor Co., Div. of Earle Hart Woodworking Machine Co., 565 W. Washington Blvd., Chicago, Ill.

The Plycor one-man electrogluer is a high frequency edge-gluer that requires but one operator. This one man handles the gluing, lays up the stock and removes the finished cores or panels. And he is able to do all this without moving out of his tracks, we are told.

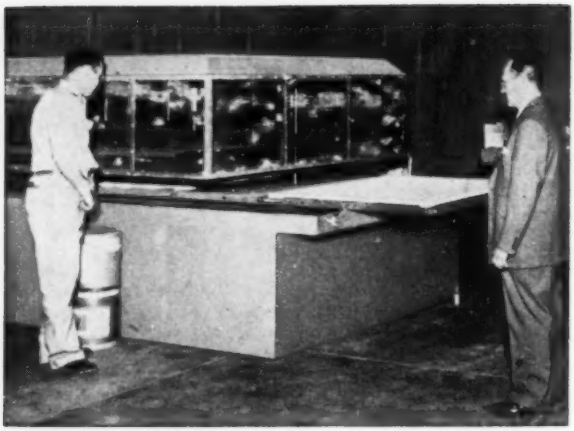
This simplicity of operation is made possible by means of a pivoted lay-up table. The accompanying photograph shows this two-station table. It is pivoted in the center so one half is always in curing position while the other half is in lay-up position.

The operator picks up the freshly glued boards from the conveyorized glue spreader conveniently placed at his right and lays up the charge on the lay-up table directly in front of him. At the end of the curing cycle the top cylinders raise, lifting up the top electrodes, the side pressure cylinders and the back stop. The operator then revolves the table (operated by air power) which brings the freshly laid-up material into curing position and delivers the finished core or panel directly in front of him. Then, while curing is in process he piles the finished piece on a truck at his left and lays up the next charge.

It is obvious that with this type of operation, there is no wasted time. Every motion of the operator is a productive motion, which accounts for the high output per man-hour. According to the manufacturer, this machine is capable of turning out from 3000 to 6000 square feet of panels, lumber cores, table tops, sash and door stock, etc. in a day's time. It will also do lumber core banding and veneer core banding and, for the production of panel-to-frame gluing and other sub-assembly



Plycor type BVH hydraulic hot plate press. No pit is required for this unit.



Plycor one-man electrogluer in operation at the Forest Products Research Society Industry Show.

work, the unit can be equipped with interchangeable electrodes.

Those who attended the show had an opportunity to observe this machine in operation producing glued-up lumber cores from lumber supplied by Lester Piano Mfg. Co. Various glues were used including those supplied by National Casein Co., Perkins Glue Co., Bakelite Corp., Rohm & Haas Co., Borden and Allwood Mfg. Co.

Panel-to-frame gluing was also done on the one-man electrogluer by means of stray field heating, both positive and

TEST YOUR LUMBER
The Most Modern Way

MOISTURE REGISTER

● A fast and easy way to test the moisture content of lumber or veneer. The RF4 type shown is used to test finished or rough lumber. We also carry the V2 type for veneer testing. No needles—finished pieces may be tested without marring the surface. The instrument tests accurately as low as 0 moisture content. Portable, fast and accurate, it is guaranteed for one year and comes complete with fabrikoid carrying case.

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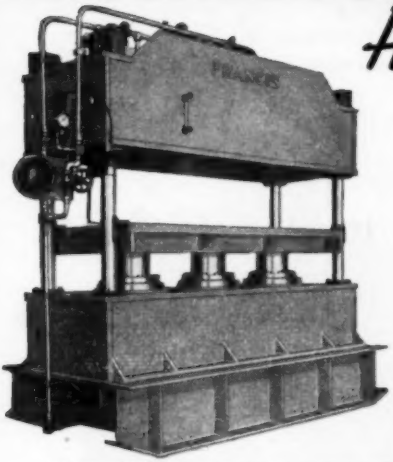
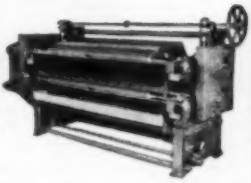
DEPENDABLE GLUE ROOM EQUIPMENT



Hydraulic COLD PLATE *Presses*

Francis presses are available for all types of laminated work in standard sizes up to 5'x12' platen size. Sturdy, heavy duty construction throughout, custom built to your specifications ... operation is simple and economical ... workmanship of highest quality.

GLUE MIXERS—Mixers for every purpose and all types of glues ... double agitation plus sweep paddle to prevent settling of glue fillers. Available in sizes up to 200 gallons, with or without stands. Can be used for mixing paint, rubber cement, etc.



GLUE SPREADERS—Pay for your glue through savings with Francis Double Roll Glue Spreaders designed for proper application. Single top and bottom coating machines, laboratory and experimental models. Simple and accurate adjustments ... easily and quickly cleaned ... in sizes from 12" to 108" in length.

● *For Illustrated Literature and Details write direct to* **CHAS. E. FRANCIS CO., Huntington, Indiana, U.S.A.**

GENERAL PURPOSE HYDRAULIC PRESS | **ELECTRIC GLUE POTS** | **CLAMP RODS "I" BEAMS**

EXCLUSIVE REPRESENTATIVE PLYCOR COMPANY
DIVISION OF EARLE HART WOODWORKING MACHINE COMPANY
565 W. WASHINGTON BLVD., CHICAGO 6, ILL.

BENEDICT *Challenger* GRINDERS

TOPS IN ACCURACY

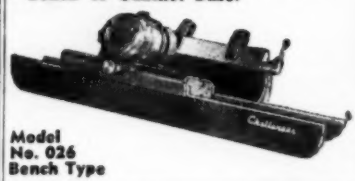
Made in standard lengths 26", 32" and 38" lengths.

Will handle blades 1/16" to 5/8" thick and down to 1/22" wide.

Precision built for speed and accuracy.

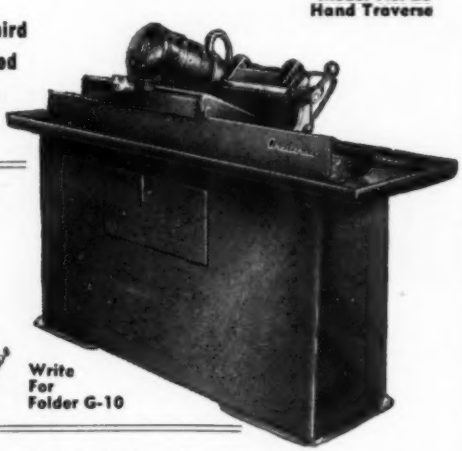
- **Aligning gauge on knife bar**
- **C-clamps cut set-up time by one-third**
- **Carriage does not overhang on bed**
- **Travels on 8 sealed ball bearings**
- **On machine-ground ways**

Furnished with or without coolant tank—Hand or Mechanical Traverse —C-Clamps or Magnetic Holding Bar —Bench or Cabinet Base.



Model No. 026 Bench Type

Model No. 26 Hand Traverse



Write For Folder G-10

Territory available to established Manufacturers Agents.

BENEDICT MFG. CO. BIG RAPIDS, MICHIGAN

negative electrodes being located in the upper platen. Jigs and materials for this work were supplied by Harry A. Prock Cabinet Co.

The Plycor one-man electrogluer is made in various sizes and is available with either a 5 k.w. or 10 k.w. Westinghouse generator with fingertip control. The equipment includes a conveyorized glue spreader with conveyor chain infeed and outfeed.

The Plycor type BVH hydraulic hotplate plywood press is a well built, compact unit for the small and medium size plant. Likewise it could be an auxiliary press for the larger operator.

Of particular interest is the fact that no pit is required for this unit. This, the manufacturer says, means fast, simple installation at low cost. Furthermore, its height is such that it should be possible to install it in almost any plant location including low-ceiling basements.

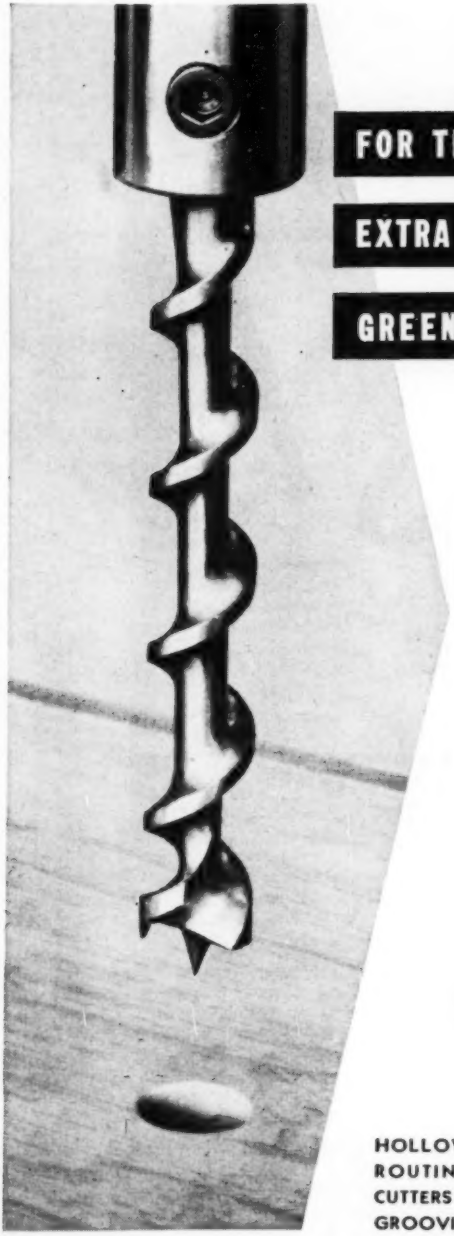
Like the larger Plycor presses, this unit is equipped with drilled steel platens which insure uniform plate temperature at all times. It is designed to operate on either high or

low pressure steam and if steam is not available it can be equipped with a self-contained steam generator. A maximum specific pressure of 100 lbs. psi is developed over the entire hot plate area providing ample pressure for all normal requirements. Equipment includes automatic electric pressure control. According to the manufacturer, this unit conforms to all safety code requirements.

During the exposition, 5-ply lumber core panels with mahogany faces were glued up on this press. These were bonded with Tego film supplied by Rohm & Haas Co. Materials were furnished by Lester Piano Mfg. Co. and the finished panels were used in the manufacture of Lester Pianos. In addition to this work, chip board was made in this same press using Synvar resins.

The Plycor type BVH hot press is available in one size only, 100"x42", loading on the 100" side. The frame is designed to accommodate five openings. However, it may be installed with either one, two, three or four openings. Additional plates may be installed at any time if desired.

Small and medium size woodworking plants should welcome this type of equipment for it will enable them to improve their production efficiency with a comparatively small investment.



FOR THE TOUGH JOBS...

EXTRA STURDY, SOLID-CENTER

GREENLEE MACHINE BITS

On these boring jobs where you need an unusually sturdy tool you'll find the GREENLEE Solid-Center Machine Bit an outstanding performer Its husky stem, or solid center, is a round section continuing from point to shank and increases in size toward shank . . . allowing proper clearance, yet a heavier body where strain occurs. Its accurate cutting edges are of extension-lip pattern with two cutters. Write for facts. Greenlee Tool Co., 2137 Herbert Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN

GREENLEE

HOLLOW CHISELS • MACHINE BITS • DRILLS
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GROOVING TOOLS FOR TIMBER CONSTRUCTION

WOOD Industry Notes

SOUTHERN SASH & DOOR MEETING

The 16th Annual Membership Meeting of the Southern Sash & Door Jobbers Association was held June 3-4-5, 1951—Hotel Peabody, Memphis, Tenn. There were approximately 250 people in attendance.

Left to right: Southern Sash & Door Jobbers Association president, M. C. Davidson, Houston, Tex., Secretary-Manager Clark E. McDonald and American Wood Institute's president, Ruel Weddington, Waco, Texas.

The following Officers were re-elected: president, M. C. Davidson; vice-president, John Kilpatrick.

The following were elected to the board for a three-year term: T. E. Addison, Jr., Addison-Rudesal Co., Atlanta, Ga.; Jack C. Convers, Wilson Lumber Co., San Antonio, Texas; T. I. Corddry, Morgan Millwork Co., Baltimore, Md.; Wm. C. A. Costello, J. R. Quigley Co., Gloucester City, N.J.; H. L. Jett, Dyke-Cole Company, Little Rock, Ark.; Walter A. Reints, Reints Sash & Door Co., Oklahoma City, Okla.; C. E. Squires, Southern Supply Co., Springfield, Mo.; P. L. Ullom, Sweetwater Sash & Door Co., Sweetwater, Texas; and Carey A. Watkins, Gulf States Plywood Co. of Fla., Jacksonville, Fla.

The board accepted the resignation of Secretary-Treasurer Clark E. McDonald with regrets, effective 6/30/51. Mr. McDonald has accepted the position of assistant to the president of the S. R. Hungerford Co., manufacturers of solid mahogany furniture. The S. R. Hungerford Company is one of the world's largest users of mahogany lumber.

The president appointed a committee composed of Messers. O. Schaefer, chairman; Corddry, Woods, Garrett, and M. Davidson (ex-officio) to select a new secretary-treasurer.

WEST COAST PLYWOOD MEETING

West coast plywood manufacturers, meeting in Gearhart, Ore., to chart intensive long-range promotion of new uses for the all purpose panels in industry and defense, have elected B. V. Hancock of Portland, Ore., president of Douglas Fir Plywood Association.

Hancock, executive vice president of Cascades Plywood Corp., assumed leadership of the 67 factory plywood industry with the panel makers currently producing at a record rate of 55 million square feet weekly to meet growing

military requirements and continuing high civilian demand.

Outlining promotion plans for the year ahead, O. Harry Schrader, Jr., association managing director, said the industry will continue its intensive merchandising in all major markets with emphasis on remodeling, maintenance and in industry where the versatile panels are used for everything from highway signs to railroad cars.

Schrader emphasized the growing importance in the plywood picture of new and allied products such as hardboards, hardboard overlay on plywood and plastic-faced plywood, declaring that such product development means new sales opportunities all along the distribution chain from manufacturer to retail dealer.

Elected to serve as vice president of the trade promotion group was Eberly Thompson of Portland, vice president and director, M and M Wood Working Co., Charles M. Duecy of Coos Bay, Ore., treasurer and general manager, Menasha Plywood Corp., North Bend, Ore., was re-elected as secretary. Re-elected as treasurer was J. P. Simpson, vice president and general manager, Buffelen Manufacturing Co., Tacoma, Wash.

AMERICAN BOX MARKS 50th YEAR

A pioneer in lightweight, wooden and wirebound box and crate development, The American Box Co., 1900 W. 3rd St., Cleveland, and its subsidiary The American Wood Products Corp., Marion, S.C., are well along to a booming 50th anniversary year for '51, with new advances in safety and economy box engineering, according to George H. Kubes, president, and son of the late John P. Kubes, founder.

Since the founding of the company in 1901, industrial progress has been paralleled by American Box contributions to wood container engineering.

Beginning with the old, hand-nailed box during the days of low cost labor and materials, the trend went to lighter weights and faster, mechanized production, using thin wood veneers, wirebound to wooden cleats.

Other variations included the use of fibre board and paper panels machine-stapled to light wooden cleats for shipping refrigerators, stoves, etc. Without sacrificing vital strength and protection, company engineers designed a cleated paper panel box (approved by the U.S. quartermaster) weighing only 19 lbs.—replacing a solid wooden box weighing 55 lbs.

The company is palletizing many of its boxes and crates, including wirebound tote boxes and also many of its box shipments. American's lightweight disposable pallet is another new development which simplifies handling.

POTDEVIN EXPANSION

The start of construction of Potdevin Machine Co.'s new one-story brick modern industrial building has been announced. The new radiant-heated building with manufacturing space of about 102,800 square feet, is located on North Street, Teterboro, New Jersey, about eight miles West of the George Washington Bridge. The Potdevin Plant No. 1, where a wide variety of paper bag and printing machinery is constructed and the Plant No. 2 Coating Machine Division will be housed in this new building. The Potdevin Export Corporation will have its executive offices in the new building.

The new plant to be situated on a 6 acre tract, will not only combine all present Potdevin manufacturing and sales operations under one roof, but will provide for immediate and future expansion plans.

Potdevin Machine Co., a large manufacturer of paper bag, printing and coating machinery has been located in Brooklyn for over 50 years. The new plant is expected to be ready for occupancy about September 15th, 1951.

Appointments

The Plaskon-Division, Libbey-Owens-Ford Glass Company announces that **Donald O. Wynocker** has been

Charles Walker **Donald O. Wynocker**

named to assist **Charles Walker** in a newly expanded sales area for the Company's glues and industrial resins. **Dean B. Thatcher** has been promoted to director of industrial engineering for Masonite Corporation. He has held a similar position at the Company's plant at Laurel, Miss., since 1948. He will now have headquarters in Chicago.

V. J. Dolan & Company have appointed **Paul L. Sharpe** of Lenoir, N.C., sales representative in the North Carolina and Virginia territory.

Appointment of **Herbert H. Clarke, Jr.** and **Charles W. Niederauer** as vice presidents of the Borden Company's Chemical Division has been announced. Mr. Clark has been manager of the Chemical Divisions West Coast activities since 1950. Mr. Niederauer has served as manager of general services and as executive assistant to the president of the Chemical Division for the past three years.

Chas. W. Niederauer **Herbert H. Clarke, Jr.**

Promotion of four persons to new positions in the Davis Plywood Corporation, Cleveland, Ohio, has been announced. **Miss Georgia Ollerenshaw**, formerly secretary-general manager, has been elected to the post of executive vice president; **E. F. Davis, Jr.**, is the new secretary and **W. H. Buckles** is assistant to the vice president in charge of marketing. **Henry R. Pfaff** succeeds Buckles as sales manager.

Elmer A. Skonberg has been elected president of the Lehwood Corporation of South Bend, Indiana. He wil continue to serve as general manager with full responsibility for the further development and promotion of the Company's woodworking processes.

NEW PLANTS

O. L. Williams, Sumter, S. C., lumber manufacturer, plans to build a forest products plant in the sawmill town of Russellville, S. C.

The plant, expected to be in operation in 12 to 16 months, will cost "several hundred thousands of dollars," according to Mr. Williams. It will convert wood waste from nearby sawmills into plastic hard and soft boards used in construction.

Sooke Lake Lumber Co. of Vancouver, B. C., is constructing a $300,000 veneer plant at Thetis Cove, Esquimalt, on Vancouver Island. The new plant, scheduled to be in operation by the end of the year, will use peeler blocks and clear-grained logs from the company's timber operations on the southern end of Vancouver Island.

B. C. Forest Products, which also has large holdings on Vancouver Island, announces plans for establishing a similar veneer mill at Youbou.

SPEED HAND ASSEMBLY WORK
with Pheoll
WING NUTS and PHEOLL KNURLED NUTS
NO WRENCHES NEEDED
Sturdy in design, Pheoll wing nuts are cold forged from either steel or brass with metal evenly distributed for maximum strength. Wings are ample in size, uniform in shape and spread at the correct angle for easy gripping. The bearing surface of each wing nut is flat and true. Threads are tapped evenly and on center to insure tight assembly without stripping.
These wing nuts are stocked in screw and bolt sizes from No. 4 to ½" with either coarse or fine threads. They are made free from burrs, scratches and sharp edges and can be furnished in different finishes such as Cadmium, Nickel, Zinc, etc.
KNURLED BRASS NUTS—Pheoll offers knurled brass nuts that are precision made with tapped holes on center and deep knurling for positive grip. A broad range of sizes is immediately available from stock.
DEPEND UPON THESE OTHER PHEOLL PRODUCTS
• Hexagon Brass Cap Nuts
• Machine Screw Nuts
• Steel and Brass Machine Screws
• Wood Screws—Sems
• Phillips Recessed Head Screws
Pheoll
SCREWS • BOLTS • NUTS
MANUFACTURING COMPANY • 5700 Roosevelt Road Chicago 50, Illinois
Industrial Fasteners and Holding Devices

OPEN SOUTHERN PLANT

Synvar Corporation has started operations in its southern plant located in Greensboro, North Carolina which will operate under the name, Synvar Southern Corporation.

This plant, located in the heart of the Southern woodworking and textile industries, will produce liquid resins to be used in the manufacture of plywood and furniture, as well as resins for sizing, crease-proofing and shrink-proofing textiles.

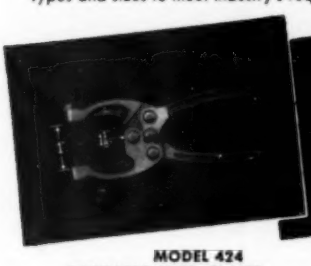
GEORGE EDWARD FRENCH

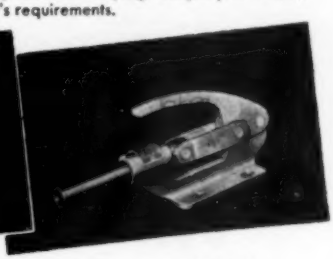
George E. French, 82, founder and chairman of the board of the Atlantic Lumber Company of Boston, died recently. He entered the lumber business as a partner in the firm of Furber, Stockford & French in 1890. Six years later he organized his own firm originally as a wholesale organization. Over the years he expanded his holdings to include timberlands and sawmills at Knoxville and Edwin, Tenn.; Sardis, Ga.; Columbia, S.C.; and Madisonville,

If you have to **HOLD**

ANYTHING in your production operations

Hold EVERYTHING with "DE-STA-CO" Toggle Clamps in welding, riveting, bonding, machining and assembly. • Fast clamping, positive holding pressures, instantaneous release—Toggle Clamps speed up your operations and cut your costs. • There are more than 40 different Toggle Clamps manufactured by Detroit Stamping Company in various types and sizes to meet industry's requirements.





MODEL 424
PORTABLE PLIER CLAMP
For one-hand use in cramped work areas and small space. Deep jaw capacity but only 4½" in length.

MODEL 650
HEAVY DUTY PLUNGER CLAMP
For "push-pull" work-holding jobs where considerable pressure is needed. Compact; up to 4000 lbs. capacity.

MODEL 235-U RETRACTABLE CLAMP (Not illustrated)
Quick, unimpeded loading and unloading of fixtures easily possible with this one. Up to 750 lbs. pressure.

Ask for "DE-STA-CO" Toggle Clamp Catalog and name of representative nearest you who is stocking our entire line of Toggle Clamps.

DESTACO **DETROIT STAMPING COMPANY**
312 MIDLAND AVE. • DETROIT 3, MICH.

Ky. He maintained a hardwood distribution yard at Buffalo, N.Y.

ANNUAL MEMBERSHIP MEETING

The American Wood Window Institute's 2nd Annual Membership Meeting was held June 3-4-5, 1951, Hotel Peabody, Memphis, Tenn. There were approximately 250 persons registered.

The following officers were re-elected: president, F. R. Weddington; vice president, Fred E. Bissell; and treasurer, M. C. Davidson.

FRANK PAXTON

Frank Paxton, founder and former president of the Frank Paxton Lumber Company passed away in May. He founded the Company in 1916 in Kansas City. His son, Frank Paxton, Jr., pre-

INSTALL A

YOUNG & BERTKE

DUST CONTROL SYSTEM

Uncontrolled dust in your plant may mean the difference between substantial profits and losses. Your production is always higher when working conditions are better. If your present dust collecting system is obsolete, if you are considering additions, or if you need a completely new dust control system, consult us. Young & Bertke engineers are specialists in the design and installation of efficient, low cost, dust control systems. We will be glad to talk to you. There is no obligation.

the YOUNG & BERTKE Co.

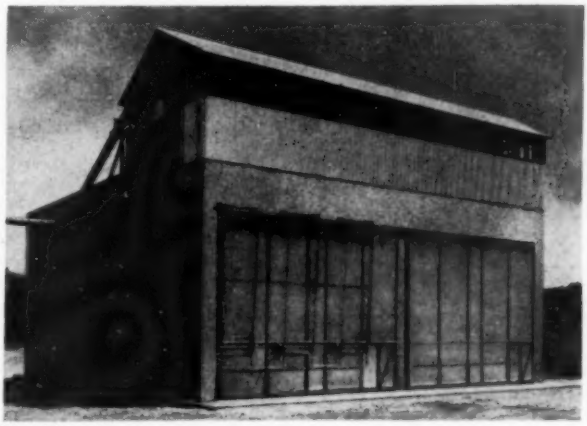
1122 Buck Avenue **Cincinnati 14, Ohio**

sent manager of the Frank Paxton Lumber Company in Chicago, was unanimously elected president of the Company. He will move to Kansas City and the general offices will remain at Kansas City.

Mr. Floyd Miller, assistant manager at Kansas City, and with a service record of 27 years, moves to Chicago to manage that operation.

SPACE-SAVING SLIDING DOOR A POPULAR CHOICE TODAY

In today's smaller homes, there is a distinct need to make every foot of space usable by occupants. This may account for the popularity of sliding doors, as brought out by a nationwide preference survey among home owners and prospective home owners. Conducted by Ponderosa Pine Woodwork, the survey showed that more



YOU

CAN AFFORD

IMRIE SIPHO-FAN KILNS

Any plant interested in the highest possible quality and overall efficiency when drying lumber can afford the latest in lumber drying equipment. IMRIE'S recognition in this field stems from a reputation for doing just that type of job . . . not from a high overall cost of kiln equipment or construction. Imrie's efficient kilns are a matter of record in the industry. This is a result of many factors, all of which add up to better design and more efficient operation.

IMRIE KILNS USE

- LESS STEAM due to the use of copper coils in all unit heaters and the added efficiency of IMRIE design.
- LESS POWER because only one-half the air is passed through the fan, the balance being re-circulated by the use of high velocity siphoning jets.
- BETTER AUTOMATIC CONTROL with the exclusive ElectroniK Multiple Thermocouple Control System.

You get all these advantages at the cost of ordinary dry kilns and in addition IMRIE has the only system that is **especially** adaptable to the remodeling of Cross-pile Kilns **without** changing the original kiln layout.

IF YOU ARE CONSIDERING A NEW KILN OR THE REMODELING OF YOUR PRESENT EQUIPMENT, IT WILL PAY YOU TO CHECK WITH IMRIE FIRST.

IMRIE DRY KILN COMPANY

PEARL & OTTAWA GRAND RAPIDS, MICHIGAN

than 68% who plan to build or remodel include sliding doors in their plans.

Clothes and linen closets are the most popular uses for sliding doors. Among those who want sliding doors, clothes closets were mentioned 86% and linen closets by 40% as uses.

The only other use indicated by an appreciable number was a partition between the kitchen and dining rooms, checked by 28%. Among other uses mentioned were closures for bedroom, bathroom and pantry entrances.

MOLDER-PLANER BULLETIN

On-the-job molding and planing is made easy by the M & M molder and planer as described in a bulletin released by the Eagle Sales Co. A versatile machine, can be changed from molding to planing in less than five

Just because gravy goes swell over noodles, he shouldn't assume it's good on hair, too!

And just because one bearing is best lubricated by one particular grade of oil, you shouldn't assume that the same oil is best for *all* bearings on that machine. In many cases it isn't.

OIL CUPS permit you to lubricate each bearing with the oil best suited to that bearing—thus prolonging bearing life, reducing maintenance costs, cutting down-time, boosting production. And oil cups fortunately *cost very little.*

Gits oil cups have been the standard for industry for more than 40 years. Gits Bros. has the largest selection of oil cups available anywhere. Call on Gits Bros. for a prompt, efficient solution to your lubrication problems.

Write for free Price Guide Catalog

GITS BROS. MFG. CO.

1878 S. Kilbourn Ave. • Chicago 23, Ill.

minutes, the molder-planer eliminates need for costly cut-to-order lumber and special millwork, converting waste stock into molding, it is claimed. Also, the bulletin states, more than 1000 cutter patterns are available for use on the molder. The machine has a table 8½"x 22" and comes complete with stand and motor. A bench model is also available.

For a copy write the above Company, Dept. WD, Keene, N. H.

"Only when the great masses of the people of the world understand the basis of our prosperity and freedom and understand and accept the fundamental truths that we believe, will we have a secure foundation for peace and prosperity in the world." —Charles E. Wilson, Director, Office of Defense Mobilization

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There is no power on earth more formidable than the power of truth.

WD New Literature Section...

SHAPER BULLETIN

You may see the design and construction features of the new Whitney 510 shaper from every angle in this fully illustrated bulletin. The shaper, built for volume production, is housed in a sturdy, streamlined, fabricated steel base with 3 point bearing support and ample toe room for the operator. The spindle speed is 10,500 rpm, assuring smooth, accurate work.

For complete specifications and other information write for a copy to Baxter D. Whitney & Sons, Inc., Dept. WD, Winchendon, Mass.

HARDWOOD RULES BOOK

Known officially as "Rules for the Measurement and Inspection of Hardwood Lumber, Cypress, Veneers and Thin Lumber," the rules book of the National Hardwood Lumber Association has served for many years as the text book of hardwood buying and selling. In addition to containing all the current rules and the sales code of the association, the book is illustrated with pictures of all the principal hardwood species together with a summary of their uses, range and working properties. A considerable amount of reference material, a list of lumber associations providing rules, list of trade papers, shipping information and sources of data on specific uses of a wide variety of wood make the book a useful, valuable reference.

Order from the National Hardwood Lumber Association, 59 E. Van Buren St., Chicago, Ill. $1.00.

PLASTIC SURFACED PLYWOOD

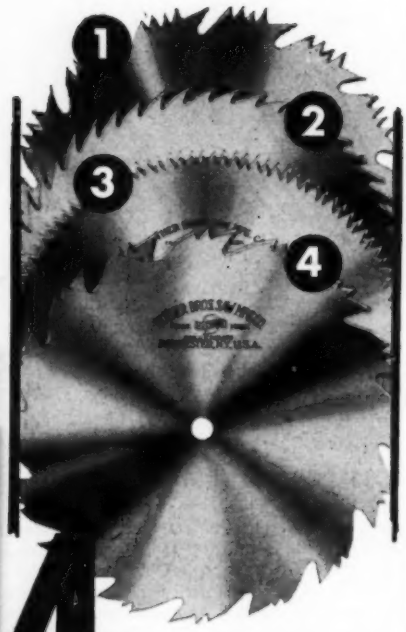
A booklet which answers the questions—what plastic surfaced plywood is, where to use it, how to use it and why it is dependable. A reference bulletin, it describes the types of plastic surfaced plywood, properties of the overlay panels, the distinct advantages of exterior plywood plus entirely new properties made possible by plastic surfaces and some of the countless applications in building and industry.

Write the Douglas Fir Plywood Association, Dept. WD, Tacoma 2, Wash.

ROUTER BULLETIN

A bulletin on the Onsrud medium duty router, Model W-180 includes features, specifications and information on accessories. Designed to provide woodworking shops with a versatile, yet dependable machine, the router is for high speed production routing for small and medium size work. Simplicity of maintenance and ease of operation are described along with the many special features that assure minimum operator fatigue.

For a copy write the Onsrud Machine Works, Inc., 3947 Palmer Street, Chicago 47, Ill.



4 REASONS

SO MANY PREFER HUTHER

1. Time saving, versatile cleaner-tooth circular mitre saw for rip or cross cut. **2.** Dependable straight ground standard rip saw for rapid feeding. **3.** Smoother cutting hollow ground cross cut saw for fine work. **4.** Set tooth, straight ground, combination saw for quantity production with or across the grain. Ideal cut-off saw.

Write for folder

HUTHER BROS. SAW MFG. CO., INC.
1290 University Ave.
Rochester 7, New York

THIS GREAT AGE

An attractive, 28-page illustrated booklet, entitled "This Great Age," shows how the wood tank has figured prominently in history. Outlining the way that man has been able to hew or rough sawed planks and fashion them into the component parts of whatever vessel he chose to make—proving the efficacy of wood for use in tank making. Descriptions of the various tanks are interestingly given along with the many uses for wooden tanks and the important role they play in this great age.

For a copy write the National Wood Tank Institute, 600 West Cermak Road, Chicago, Illinois.

FOREST BOARD BULLETIN

"How and Where to Use Forest Board" is the title of a bulletin issued by Forest Fiber Products Company. The usage and application of hardboard is not thoroughly understood by many and this bulletin will help to give a better understanding of the advantages of hardboard the company states. Step by step application instructions with illustrations are given with information on bending and painting.

For a copy write the above Company, Dept. WD, 316-20 Pacific Bldg., Portland 4, Oregon.

BOXES AND CRATES

A booklet, issued by the Southern Pine Association, gives important information on a field vital to industrial men everywhere; the proper packaging for merchandise for safe, economical shipping.

Well illustrated with photographs and drawings, the booklet explains just what to look for in selecting and building a tough, strong, economical package. The engineering details that make a crate or box a hardy container are given and data on the most accepted kinds of containers allows the shipper

to select the one best suited to his needs.

For a copy, write the Southern Pine Association, Dept. WD, 520 Canal Building, New Orleans, La.

ATLAS WOODWORKING TOOLS

Atlas woodworking tools, for industrial and commercial woodworking, construction of all kinds, are fully illustrated and described in a 36-page catalog. Among the tools listed are tilt arbor saws, jointer-planers, band saws, spindle shapers, lathes, sanders, jig saws, presses and their attachments and accessories.

For a copy write the Atlas Press Company, Dept. WD, 411 Pitcher St., Kalamazoo, Mich.

AIR-DRIVEN TACKERS

Faster, easier, better tacking is claimed possible in a bulletin featuring Duo-Fast air-driven tackers. The fasteners are lightweight, compact units that can be used without fear of operator fatigue. The bulletin illustrates the machines in use for various applications and includes suggestions for use and specifications on the machines.

For a copy write the Fastener Corp., Dept. WD, 860 Fletcher St., Chicago 14, Ill.

AUTO-NAILER CATALOG

A 16-page, fully illustrated catalog featuring Auto-Nailer nailing machines. The Spartan model, Crusader model and the Blue model nailing machines are shown with full description and specifications for each one. Sections of the catalog are devoted to the many varied uses of the nailing machines and also on-the-spot scenes of these machines in action in various plants.

For a copy write the Auto Nailer Company, Dept. WD, 267 Marietta St., N. W., Atlanta 3, Ga.

Dedgie the Planer Boss says:—

"I see in a newspaper item: — 'More labor unions seek cost-of-loving contracts'."

We find that mill men are more interested in cost of production which is materially lessened by using

DETROIT KNIVES

PLANER—MOULDER
VENEER—CLIPPER
SHAPER STEEL

The longer edge-holding and long useful life of DETROIT knives help keep down production costs. This is why so many mills are regular users of DETROIT knives.

Better knives since 1885

DETROIT EDGE TOOL CO.
3423 WIGHT STREET
DETROIT 7 MICHIGAN

FESTO *Semi-Automatic shutter grooving machine*

for cutting grooves in louvered doors, window-shutters, gable-louvers etc. The cutterhead can be adjusted to any angle for left or right horizontal and vertical slots by means of graduated dial. One of the many advantages of this machine is the adaptability to short-lot jobs, because it requires only a few minutes to change from one set-up to another. The machine has a built-in three phase motor. The clamping of the workpiece, the infeed and the grooving is performed by a single lever movement. This and the fast cutter-speed makes this a very rapid operating machine. Other Festo-equipment includes, stationary lacquer finishing machine, single-end tenoners, chain-mortising machines, radial saws. Write for catalog and price list.

SPECIAL WOODWORKING MACHINES

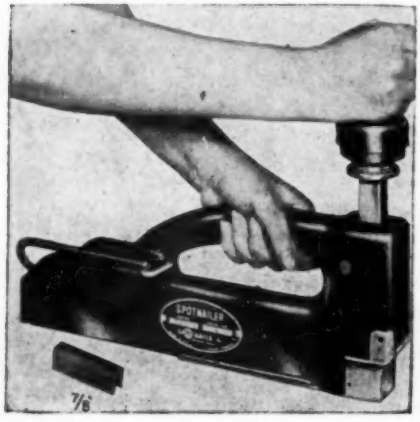
745 — 51st STREET, BROOKLYN, N.Y.

Equipment and Supplies for the WOOD WORKING INDUSTRY

PORTABLE NAILING MACHINE

Portable automatic nailing machine drives a heavy 16 gauge ⅞" staple into soft or hard wood with one blow of the fist or rubber mallet. Crates, pallets, sub-flooring, roofing, and similar fastening jobs are securely nailed quickly and without hammer marks, we are told by the manufacturer, Spotnails, Inc., of 1218 Sherman Avenue, Evanston 20, Illinois.

A completely redesigned molded frame and several other improved features have been included in the new heavy duty Spotnailer Model AHE. Easy loading magazine of extra capacity, positive feeding and driving mechanism, light-weight and durable plastic frame, are important factors contributing to the improved performance of the new machine.



The heavy staples have divergent points for greater holding power. May be driven through two or more pieces of material to brad against a steel plate. The galvanized staples are available both coated and uncoated. Machines drive either flush or countersink to suit.

SIMULATED METAL FINISH FOR WOOD PRODUCTS

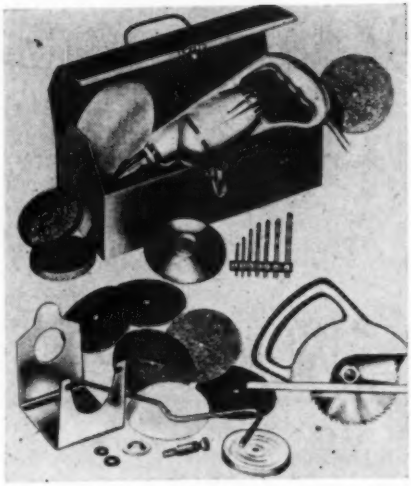
A new simulated metal finish for wood products which permits conservation of critical metals used in accessories for radio and television cabinets, furniture and many other products was introduced by J. H. Duncan, vice president of Warsaw Products, Inc., Warsaw, N.Y., at the National Furniture Show, in New York. Duncan said that the new finish is different from ordinary metallic finishes and that it will retain luster and metallic appearance even after the severest usage.

"The metal shortages have not yet seriously affected the furniture indus-

try," Duncan said, "but the situation is expected to change very rapidly during the last quarter of this year. Warsaw Products, Inc. is now producing a complete line of knobs and pulls with the new "Warmet" simulated metal finish. We are also prepared to reproduce almost any shape or style according to the furniture or radio cabinet makers' design, and at lower costs than for those made of solid metal. In some designs our prices for "Warmet" finish accessories range up to 70% reduction."

ELECTRIC POWER TOOL OUTFIT

A new power tool kit is being marketed that provides a veritable portable "service bench" in one small, compact steel carrying case. For benchwork or on call jobs, maintenance men will find their assignment a lot faster to complete with this power outfit. Every tool needed for wood cutting, sanding, buffing, polishing, drilling or mixing is provided in this kit by Kapner Hardware, 2248 W. 2nd Ave., New York City.



5 BASIC UNITS IN 1 PLURALITY

OILSTONE GRINDERS

With one Mummert-Dixon Plurality Oilstone Grinder you get (1) Coarse Oilstone Wheel, (2) Fine Oilstone Wheel, (3) Grinding Cone, (4) Leather Stropping Wheel and (5) General Grinding Wheel. Made in 3 sizes to meet every grinding and sharpening requirement in woodworking plants. Designed for hard and long usage. Efficient. Easily accessible. Investigate Mummert-Dixon equipment now. Send for informative literature today. No obligation.

MUMMERT-DIXON CO.

124 Philadelphia St., Hanover, Pennsylvania

The power tool is a high quality ¼" electric drill built for rough industrial use. These are the items that comprise the outfit: ¼" electric drill for 115 volts, AC operation, 4" portable electric saw attachment, 4" saw blade, lambs wool bonnet, 6 sanding disks, 7 assorted drills, steel arbor and attachments, cloth buffing wheel, grinding wheel, wire wheel brush, steel paint mixer, steel bench stand and a portable steel carrying case.

PLASTIC VENEERS FOR FURNITURE

A selection of new wood grains, authentic reproductions by Di-Noc, were displayed for the first time at the Chicago Furniture Mart, June 18-29, by Panelyte, a division of St. Regis Paper Company.

The wood grains—limed oak, walnut, mahogany, primavera and maple — round out the Panelyte line of laminated plastic veneers that lend beauty and durability to furniture manufactured of this hard-to-mar material. Each Panelyte wood grain is available in two colors.

During the year since case goods and occasional tables of plastic veneers had been pioneered by Panelyte and Lincoln Industries, manufacturers of the Virginia House-Panelyte line, the trend toward plastic veneers "has made considerable progress," we are told.

The trend has been pronounced not only in the home but also among operators of commercial establishments, such as hotels, motels, and steamship companies, and in professional offices — where furniture possibly is subjected to the greatest hazards of damage by rough treatment or moisture penetration, particularly in the case of ocean-going vessels.

PANEL CUTTER

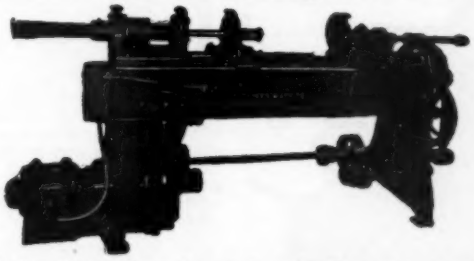
A new raised panel cutter, which incorporated all the features and ad-

G

GOODSPEED

VARIETY LATHES

Automatic Self-feeding Ball bearing



For various kinds of turnings from the smallest size up to 3" diameter and 7½" long. We can furnish FOUR different types in FOUR different capacities for turnings up to 1½", 2", 2½" and 3" in diameter.

Write for bulletins covering these fast money saving lathes which are easy to set up and cover a wide range of work.

GOODSPEED MACHINE COMPANY

WINCHENDON, MASS. -:- U. S. A.

G G

vantages of their recently developed Tru-Form relief safety cutters, has now been engineered by Boice Crane Company, 931 Central Ave., Toledo. Finest commercial quality raised panel detail on doors is easily produced with this new cutter.

By the Tru-Form principle, the shape is machined into the cutter on an arc that assures clean cutting and the elimination of burning ordinarily due to lack of clearance. Cutting qualities are so improved by this design as to result in smoother work, lessened power requirement, longer service without resharpening and consequent longer cutter life. The shaving-like cut furthermore reduces machine wear and tear.

The cutter shape is permanently milled in by the Tru-Form principle so that the same true original shape and dimensions are cut right up to the last sharpening. The last panel cut will exactly match the first, regardless of the number of cutter regrinds, it is claimed. Tru-Form cutters have extra body to permit dozens of resharpenings—50% more usable life—and afford extra safety. The increased metal back of the cutting edge reduces chipping and crumbling under heavy cuts and dissipates the heat faster on high speed production, the manufacturer claims.

Tru-Form cutters retain all the advantages of old-style flat knives but eliminates the disadvantages and associated dangers, providing a much wider margin of safety.

SANDING EQUIPMENT

Behr-Manning, Troy, N.Y., double-faced garnet finishing paper simplifies the sanding of reeded and fluted posts. Designed for use on a vertical spindle

Insert Saw . . . then forget it

K5 does the rest . . .

files, sets, joints

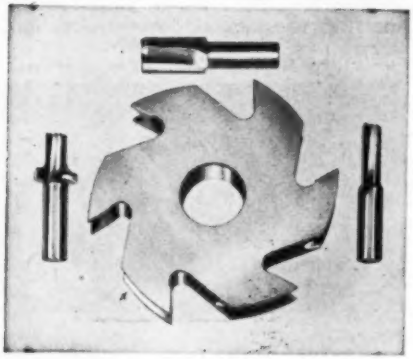
K5 files, sets and joints band saws in one set up. It formerly required two machines to do this work. Now one can do both and in addition do it in half the time. The saw is rigidly locked by steel cam while being filed and set. The teeth are filed and set and joined with absolute uniformity. The result yields cleaner, faster cutting with longer periods between replacements.

Write for Bulletin K-5—The Wardwell Mfg. Co., 3161 Fulton Road, Cleveland 9, Ohio

WARDWELL

Maker of the largest line of saw and tool sharpening machines

Sterling Quality
Woodworking TOOLS



Router Bits - Form Cutters
Shaper Cutters - Sash Cutters

Some dealer territories open

STERLING CUTTER & MFG. CO.
728 Sixth Street **Rockford, Illinois**

MILWAUKEE WROT WASHERS
SINCE 1887

WASHERS - BLANKS STAMPINGS

Your most dependable source of supply—the world's largest manufacturer of Washers, serving Industry since 1887. Over 22,000 sets of Dies.

Submit your blueprints and quantity requirements for estimates.

WROUGHT WASHER MFG. CO.
The World's Largest Producer of Washers
2261 S. Bay Street Milwaukee 7, Wis.

VULCAN

ELECTRIC BRANDING IRON

BRANDS QUICKLY EASILY PERMANENTLY

company names, trademarks, initials, serial numbers, or any design — on wood, leather, rubber or plastics.
For furniture, tires, movable equipment such as shovels and ladders, wooden shipping cases, tool handles and hundreds of other articles where permanent identification is desirable.
Send specifications for quotation.
By the makers of Vulcan Electric Soldering Pots and Electric Soldering Tools.

VULCAN ELECTRIC CO.
Danvers 11, Mass.

HERE IT IS!

A Dependable, Inexpensive Addition to Your Material Handling Equipment.

LIFT TRUCK JACK & PLATFORM

The lowest price combination available in semi-mobile factory or shop handling equipment. You can't beat it for semi-heavy work or convenience. Equipped with steel or rubber wheels.

Write for Complete Literature

GLOBE VISE & TRUCK CO.
203-07 Front Ave. N.W.
Grand Rapids 4, Michigan

sander, this method is also adaptable to horizontal spindle operations.

Double-faced, (coated both sides), cut sheets 4"x10" with 15/16" arbor holes, arranged in a staggered fashion to form a loose buff 25 to 100 sheets in thickness, provides an ideal tool for the final finishing of deep grooves and creases.

Available in grits ranging from 80-0 (medium-coarse) to 240-7/0 (fine), depending on the finish required, this method of finishing is adaptable to soft materials other than wood, like plastics, molded rubber, etc.

TALALAY PROCESS FOAMED LATEX SLAB STOCK AVAILABLE

Available for the first time is the "Texfoam" foamed latex slab stock made by the Talalay process it is announced by The Sponge Rubber Products Company, Shelton, Connecticut. The process chemically froths the liquid latex and vulcanizes it in that state. It differs from the latex foaming process in general use where air is whipped into the latex by giant beaters.

WRITE
McDONOUGH MANUFACTURING CO.
Incorporated 1888
EAU CLAIRE, WISCONSIN
"World's Largest Producer of Band Resaws"

G.R.D. .. your most RELIABLE Source for DOWELS

Yes... look to G.R.D. as a *reliable* source for dowels, plugs, buttons, drawer stops, table pins; precision-made and absolutely uniform. Quick delivery, too—your complete order is on its way promptly after receipt of your call or written request. All popular sizes are carried in stock.

G.R.D.'s entire line is competitively priced.

Write for information and prices on small wood parts, profile and variety lathe turnings, and metal corner braces. *Phone 3-2814.*

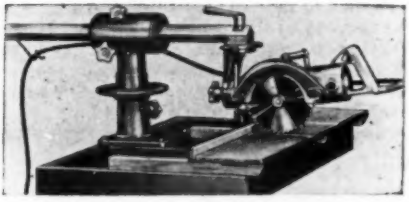
GRAND RAPIDS DOWEL WORKS
713 Burton St., S.W., Grand Rapids 9, Michigan

Up to now all "Texfoam" of The Sponge Rubber Products Company manufacture has been devoted to bed pillows, molded furniture cushion units and utility stock, all containing the famous core holes of all latex foam production. It is in response to requests by users of Talalay process "Texfoam" that the company undertook to establish the special facilities needed for continuous roll slab stock production.

Initially, the new uncorded slab stock will be available in rolls of random 36" width and thickness of ¼", ½", ¾" and 1". Rolls range from 36 feet for 1" thickness to 144 feet for ¼" thickness. Densities are soft, medium and firm. Unique features claimed by the company for their new slab stock are excellent tensile strength and complete absence of "skin."

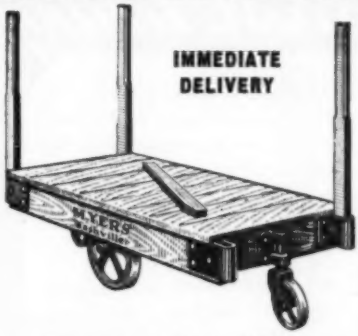
NEW SKIL RADIAL SUPPORT

Skil saw models 77, 87, 800 or 825 can now be converted to radial saws, Skilsaw, Inc., 5033 Elston Ave., Chicago, Ill., announces. This is possible through the introduction of the new Skil radial support. With this support all radial cuts may be made: cut-offs, bevel cut-offs, bevel rips, miters, bevel miters, dados and ploughs.



A full-size 8½"x40" work table permits large pieces to be cut at any angle or bevel up to 45°. The steel arm can be extended 22½" horizontally. Vertical maximum adjustment is 6½". The width and depth of cut vary slightly depending upon the saw model used.

MYERS "TOUGH BUILT" TRUCKS



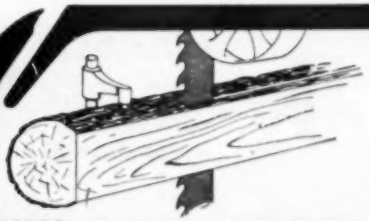
Capacities: 1500 to 5000 lbs.
Platform Sizes: 21 x 42" to 36 x 72"

Catalog and Prices upon Request

MYERS TRUCK & CASTER CO.
914 Trinity Lane . . . Nashville 7, Tenn.

BURTON STEEL HEAD BAND SAWS

Burton Saw Co.
WORCESTER 8, MASS.



LOG BANDS BAND RESAWS NARROW BANDS

BLACK GLUE SPREADERS

Black Brothers of Mendota, Ill., have a hand feed glue spreader which includes a precision ground upper friction feed roll running on roller bearings and having a vertical adjustment which holds the work firmly against the gluing roll insuring an even spread of glue. This is available on all Black Brothers 12, 18 and 24" solid roll spreaders of this series, and has a vertical adjustment of approximately 0-4"

(more on special orders).

These spreaders are furnished with a water jacket around the glue tank which may be used for steam, gas or electric heat for hot glues, or for the purpose of circulating cold water to reduce the temperature of cold glues.

The motor drives on these machines are of the fully enclosed type which are connected directly to an enclosed speed reducer which runs in oil and on Timken roller bearings. All solid roll spreaders of this type are now equipped with a power driven doctor roll type of scraper. This provides positive control of the glue and adds greatly to the convenience, accuracy and economy. Bar scrapers will continue to be furnished on the brush roll machines.

CHRISTMAS GIFTS

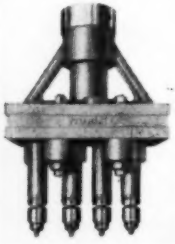
Here are a couple of items that have

GLUE *Testing*

Testing glued wood products to meet the requirements of industry and Government specifications for strength and moisture resistance is one of the many laboratory services we perform for small and large firms.

Our modern testing facilities and experienced wood technicians can help you on both civilian and Defense products.

Research Laboratory
TIMBER ENGINEERING COMPANY
1319 18th ST., N. W., WASHINGTON 6, D. C.
WD



MULTIPLE SPINDLE DRILL HEADS
ADJUSTABLE TO STRAIGHT LINE AND RADIAL PATTERNS
FIXED HEADS TO SPECIFICATIONS LITERATURE ON REQUEST
NOBLE MACHINE TOOL CO. 195 Weeden St., Pawtucket, R.I.

come our way and which we believe would make fine gifts if you remember your customers in such a way.

The first is a reproduction of Conestoga wagon. This wagon, complete in every detail, is wired and can be used as a television lamp or night light. From the shafts in front to the end drop in the rear, it is completely hand fashioned by expert craftsmen, made of natural wood with copper trim and brass chain. The wagon cover is of gabardine and comes in red, tan, green or chartreuse. The wagon carries a plow, water bucket, pork barrel, lariat, brakes that work, bed roll, ax, shovel and wash pan.

If you are interested in large quantities, or as a dealer, distributor or salesman, contact Leonard White, 619 S. Ward St., Compton, Calif.

One-piece oval wooden picture frames, available in four sizes, are being offered by the Hugo Schmidt Company. There are over 600 different prints and sizes available. The manufacturer guarantees the frame against chipping, splitting, fading, cracking, peeling or warping. The frames can be ordered in eleven colors or shades to contrast or blend with any color decor. Another item handled by this same firm is a shadow box frame which comes in two-tone combinations of green, red or black and white with mahogany or maple finish.

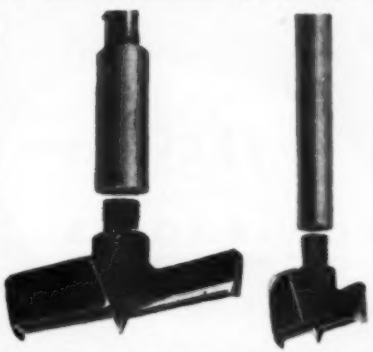
If you are interested in learning more about these items or in serving as a distributor, write to the Hugo Schmidt Co., 36 W. Union St., Pasadena, Calif.

FINISHING SANDER

This new sander, designated as model 105, finishing sander, is not a "vibrator" sander, but a powerful motor-driven machine with two counter-balanced transmissions. Cabinet makers, furniture manufacturers, schools, millwork shops, boat owners and factory maintenance men can reduce their hand sanding time with the Guild finishing sander, we are told. The Guild finishing sander is manufactured by the Porter-

PLANETOR CHIP FLOW MACHINE BITS

Supreme in smoothness, speed, endurance



STOCK SIZES: 1" to 4" by 16ths. 4⅛" to 6" by 8ths on special order.

Dealers in Principal Cities

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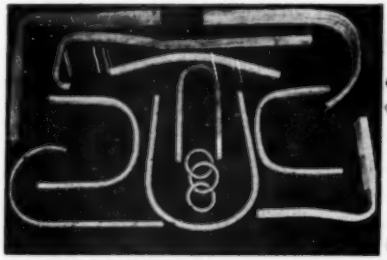
BOX 30 HAYWARD, CALIF.



BENDWOOD

If it Bends We'll Bend It!

Standard and Custom Bends Our Specialty

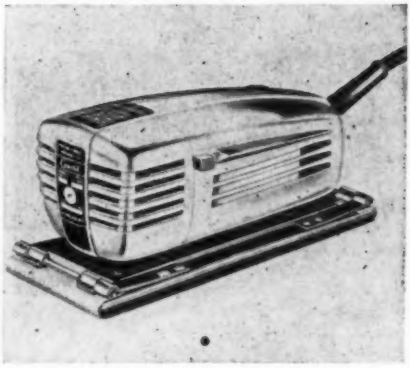
Sorensen & Peters, Inc.

Box 145-H Westerly, R.I.

Cable Machine Co., Syracuse 8, New York.

The abrasive pad of the machine revolves in a 3/16" diameter orbit at 5000 r.p.m. Consequently the thousands of abrasive grits traveling in tiny, overlapping circles produce a uniform, smoothing action. The result is a "hand rubbed" finish without scratch or mar regardless of the direction in which the sander is guided.

This compact sander, 9" long, 3" wide and 3¾" high, is said to be easily maneuverable in corners and close to trim or molding.



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POWER TOOLS

for cutting • shaping • drilling • finishing

WOOD • METAL

PLASTIC • FIBRE

BOICE-CRANE COMPANY

931 CENTRAL AVENUE TOLEDO 6, OHIO, U.S.A.

PUSH-PULL RULES

Stanley Tools of New Britain, Connecticut, announces new "Pull-Push" rules No. 556 (6 ft.) and No. 558 (8 ft.) featuring a blade ⅝ of an inch wide for greater rigidity.

Nickel-plated blade has a special rust-resistant finish built up around graduations and numerals for maximum wear. Blade may be safely and positively replaced in a few seconds "outside" the case. Modern streamlined "D" shaped nickel-plated case with brushed satin finish, is handy for inside measuring—read measurement at case opening, add two inches (width of case) for exact inside dimensions. Large black numerals and graduations are easy to read.

IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

GUSTAFSON & SCOTT MFG. CO.

1637 Lowell Avenue Chicago 39, Illinois

PORTABLE HAND SAW

The Lesto portable hand saw is seven saws in one, it is said. The saw, furnished by Victor J. Krieg, Inc., 55 W. 42nd St., New York 18, N. Y., does the work of rip, cross-cut, scroll, keyhole, coping, band and jig saws.

This saw comes in two sizes, the larger for factory work and the smaller for light work in shops or factories.

DEFIANCE 38" KNIFE GRINDER

A 38" capacity knife grinder for grinding and conditioning all types of straight knives has been announced by the Michigan Defiance Company of Big Rapids, Michigan.

The Defiance 38" Knife Grinder features a mechanical transmission which is totally enclosed and protected from dirt and foreign material. A hardened and ground steel worm gear with bronze worm wheel, mounted in ball bearings is employed. Rigidly mounted in ball bearings, transmission drive is through a vertical shaft. The motor which drives both grinding wheel and transmission is also of the ball bearing type.

Defiance 38" Knife Grinder is sold complete with motor, starter, knive bar,

High Speed HANGER BOLT DRIVING . . .

A NEW, FAST OPERATION TIMED IN SECONDS!

This tool is used by a majority of plants where hanger bolt driving is done on a high production basis. Can be operated at any speed which is safe for driving the hanger bolt. (It is not necessary to stop rotation at any time.)

- AUTOMATIC TAKE-UP FOR WEAR ON JAWS
- REVERSING POSITION OF CLUTCH GIVES DOUBLE WEAR AT HALF COST
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Production Tools

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Now you can quickly learn to be a successful wood production engineer, cost man, detailer or rod-maker, through the Klok home-study course.

I've helped men for over 20 years to top positions and can do the same for you. This training is for beginners as well as for those of you that have practical experience in the plant, and now want to learn the real fine points of production, cost, etc. Write today without obligation, for free booklet.

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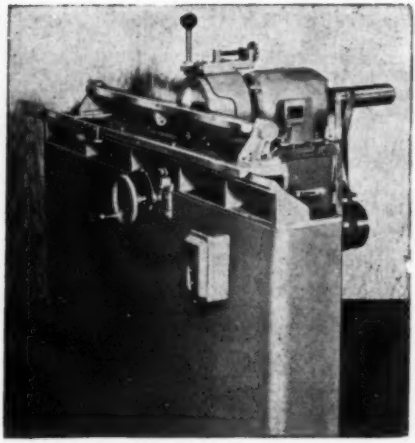
CLAMPS

Jorgensen offers a complete selection: Hand Screws, Drop Forged and Malleable "C" Clamps, Steel Bar Clamps, "Pony" Clamp Fittings and miniature "C" Clamps — the very best in service giving quality.

ADJUSTABLE CLAMP CO.
"The Clamp Folks"
418 N. Ashland Ave., Chicago, 22, U. S. A.



set of clamps for thick and thin knives, grinding wheel, pulleys and belts. A specially designed wheel dresser mounted on a fully machined and adjustable slide of heavy construction is available at a small additional cost.

UNIVERSITY OF ILLINOIS USES TREATED WOOD IN NEW BUILDING

The short supply of naturally decay-resistant wood is responsible for the use of treated millwork in at least one new building at the University of Illinois.

The original specification for window sills and frame parts for the new 2.4 million-dollar Animal Science Building called for clear, heartwood, kiln-dried Tidewater cypress. Because millwork manufacturers could not meet the specifications, these were revised to include eastern white pine as a substitute species. The same difficulty was experienced in fulfilling the millwork contract with the white pine. Finally it was agreed to try pressure-treated ponderosa pine.

Treating specifications prepared by C. S. Walters of the University's Foresty Department called for 200 pieces (2,500 b.m.) to be "pressure-treated by the empty cell, 'clean treatment' process following manufacture with a paintable, mineral spirits solution containing 5

percent (by weight) pentachlorophenol, and water-repellent materials. A minimum absorption of 5 pounds of solution to be retained per cubic foot of wood following final vacuum. Toxicant to meet specification P8-49 of the American Wood Preservers' Association as outlined in their Manual of Recommended Practice. Pentachlorophenol solvent and water repellency to meet the specifications of the National Woodwork Manufacturers' Association. The empty cell method of treatment to conform with Specification T1-49, Process 2.21 of the American Wood Preservers' Association's Manual of Recommended Practice."

The initial cost of the treated wood was less than the estimated cost of untreated wood. Also the average cost per year of service for the treated wood will probably be less than that for untreated cypress or eastern white pine.

The use of water repellents will help to control shrink and swell in finished millwork, so it would be desirable to have the sash as well as the frames and sills treated. In view of current shortages of some species that have been generally used in the past, those preparing millwork specifications should consider wood preservation as a means of securing cheap, satisfactory service from nondurable species.

M. D. FULLER RETIRES

M. D. Fuller, Boice-Crane factory representative in the middle south since 1933, has now retired to enjoy his farm and to travel.

His successor is Allen Cook, 802 Holcombe Avenue, Mobile, Alabama.

Mr. Cook, a woodworking machinery manufacturers' representative for several years, will travel the same mid-south territory relinquished by Mr. Fuller.

The Boice-Crane Company are manufacturers of a full line of intermediate capacity woodworking and metal working machines.

Hamilton
FACTORY TRUCKS
ESPECIALLY DESIGNED FOR THE WOOD-WORKING INDUSTRY
NO. 800
Hamilton
Cap. 1500 lbs.
Heavy Duty Wheels & Casters
Standard sizes 24" x 48"—30" x 48"—30" x 60". Special sizes and styles to order—capacities up to 7500 lbs.
Write for descriptive circular and low prices.
THE HAMILTON CASTER & MFG. CO.
1800 Dixie Highway Hamilton, Ohio

CONTINUOUS MOISTURE DETECTOR

The problem of detecting or controlling excess moisture in the manufacture of wood products and other materials has been solved, according to an announcement by the Plywood Research Foundation, Tacoma, Wash., the research group of the West Coast Plywood industry, that a continuous moisture detector has been invented and proven successful.

The solution is an entirely new device which automatically rejects or marks wood or other material at or above any given degree of moisture content. In operation, it affords continuous, accurate production-line moisture detection or control during the manufacturing process before assembly or completion.

Marketed under the trade name Laucks Sentry, the new instrument is manufactured by the Instrument Division, Laucks Laboratories, Inc., Seattle, Wash. It is being marketed by Laucks Sentry Products, 4441 Stuart Building, Seattle 1, Wash.

Initially, it is being made available to furniture and veneer manufacturers, although it can be adapted to virtually any manufacturing process where moisture is a problem .

The first application of the new instrument was made in the wood products field with original test installation being made more than one year ago in a furniture manufacturing plant.

The problem it was given to solve was to sort out all stock which exceeded 8½% moisture content of core stock. Because of excessive moisture, considerable trouble had been experienced with this stock in radio frequency gluing. Due to this lack of moisture control, the finished assemblies occasionally were prone to warping, delamination and cracking of veneer overlays.

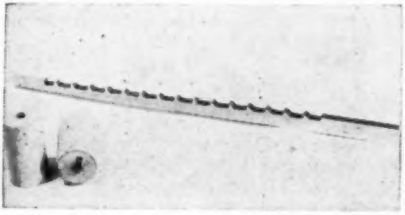
The jointer machine was selected as a convenient location for the moisture detector and it was arranged to mark automatically all excessively wet stock. The ink marker was actuated through a relay by a signal originating at the electrode. This arrangement was set so that the probe would place a mark on all stock which was over the desired 8½% moisture content.

The test installation was highly satisfactory in every respect. According to the management, which intend to install another unit, the new instrument has been of tremendous benefit in its ability to control the quality of plywood. It has enabled the plant to maintain a uniform control of cores going into plywood and enabled the plant to hold down the rejects to the lowest possible point.

While the first installation of Laucks Sentry has been made in a furniture plant, with a second one being installed in a plywood mill, the Foundation states that the continuous moisture detector can be adapted to the manufacture of any product where moisture is a problem.

TIME-SAVING BROACH

The broach pictured, designed by engineers of the du Mont Corp., Greenfield, Mass., has added chip room for a long cut, produces a ⅛" keyway in a 17/64" dia. hole in a hard maple core about 2" long, used as a film spool by Ansco of Binghamton, N. Y. A clean, accurate keyway is now broached in three seconds.



Contrast this with the costly, time consuming method formerly used, which was to saw the keyway, then glue part of the radius of the core back in to complete the keyway. Ansco's shop superintendent states that cost has been cut 80%.

A variety of applications of production type keyway broaches, and handy "Minute Man" kits for cutting keyways from 1/16" to 1" wide in bores from ¼" to 3" by 1/16" steps, are available from the company.

WE COME ALL SIZES IN OUR FAMILY!

SOUTHERN

makes a complete line of Slotted or Phillips head

WOOD SCREWS

You're always able to get the exact lengths and sizes you want when you use Southern wood screws. For Southern offers a complete range from ¼" No. 2 to 4" No. 20 in steel and 4" No. 18 in brass. Slotted or Phillips heads. Specially lubricated screws are available for hard woods.

Southern wood screws are made of the finest materials—high grade extruded brass wire or top quality selected sulphur steel wire. Single-thread construction gives Southern screws extra strength in body and shank. And our advanced methods of production assure you screws of perfect uniformity. Expert packing makes Southern screws easy to handle on the production line. Get all the facts! !

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325 W. Ohio St., Chicago 10, Ill.

SOUTHERN

SCREW COMPANY

114 Rickert Street Statesville, North Carolina

IMPROVED SAW SHARPENER

Hanchett Model 772 Circular Saw Sharpener now employs air power in the shift mechanism of its grinding head. This improvement was just announced by Hanchett Manufacturing Company of Big Rapids, Michigan. Elimination of more than 25 parts through this advancement in design has resulted in smoother operation and reduction of wear on moving parts to an absolute minimum, we are told.

Precision-built for saws 20" to 72" in diameter, the Hanchett 772 is available for larger saws on special order. It is used for rip, crosscut, slasher, and inserted tooth saws with teeth spaced from 3/8" to 3", and is designed for heavy duty service in sawmills, pulp and paper mills, as well as in veneer, plywood and woodworking mills of every kind.

HOSE FOR EXHAUSTING
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FLEXAUST . . .

SPIRAL-REINFORCED HOSE, LIGHT, STRONG & VERY FLEXIBLE

Flexaust is of proven suitability for a wide variety of suction and pressure uses in ventilation, fume and dust control.

EXTREMELY EASY TO INSTALL — EFFICIENT AND ECONOMICAL IN USE

SIZES 1¼" to 28" dia. Various Flexaust types, accessories, and other hose types available.

BLOFEX — Non-reinforced collapsible hose

PORTOVENT — Ring-reinforced retractable hose.

Write for full descriptive data and prices.

American Ventilating Hose Company
17 Park Row
New York 38, N.Y.

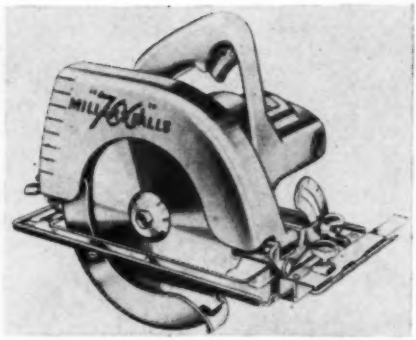
PORTABLE ELECTRIC SAW

With the introduction of the new No. 700, 7-inch saw, Millers Falls Company of Greenfield, Mass., rounds out its line of portable electric saws, which includes 9- and 10-inch heavy-duty models.

Lightweight (only 11 lbs.), high capacity (2⅜" at 90°) and good balance make the new No. 700 particularly suitable for general construction and maintenance work. It is the smallest size saw which will make 45° mitre cuts in finished 2" lumber, we are told, thus providing capacity to handle 90% of all ordinary sawing jobs. Maximum safety is assured by a completely guarded saw and instant trigger switch control.

A full ½ h.p., universal type motor supplies ample power for ripping or cross-cutting at full capacity in hard or soft woods. Using abrasive discs, the No. 700 is also recommended for cutting metals, concrete, tile, etc. Any standard 76 blades or discs with ⅝" arbor hole may be used.

Power is transmitted to the saw

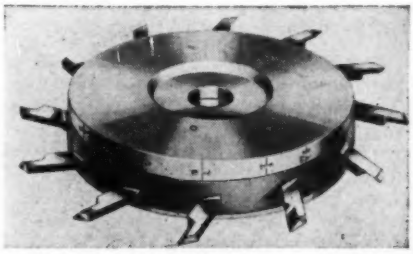


through precision cut, helical gears. Precision ball bearings are used throughout. The motor housing, handle and saw guards are aluminum alloy castings.

QUICK SET DADO

A new, instantly adjustable dado tool that cuts up to 1" deep in widths from ¼" to 1-1/16" has been placed on the market by Consolidated Machinery and Supply Co., Ltd., 2031 Santa Fe Avenue, Los Angeles 21, California.

This new tool, known as the 9" quick-set dado, can be set for any width dado by merely loosening the arbor nut and turning the graduated dial. It is not necessary to remove the tool from the arbor, we are told. Cutting action is from 12 high speed tool steel blades which slice through hardwoods without vibration, chatter, burning or chewing, the manufacturer claims. It is said that these blades retain their edge and last five times longer than conventional dado blades.



The 9" quick-set dado is patterned after the smaller 6" model recently announced. Its larger size and capacity make it more suitable for commercial use on table and radial saws. The 9" dado is bored for a 1" shaft; ¾" and ⅝" bushings are also available

SIMONDS ANNOUNCES "EASY-CUT" SAW

Simonds new design "Easy-Cut" saws are now available through leading industrial supply distributors, according to an announcement made by Simonds Saw and Steel Company, Fitchburg, Massachusetts.

Because it has relatively few teeth and each tooth takes a limited "bite," this new design saw minimizes kickback, consumes less power and is quieter in operation, we are told. Best suited for ripping, this saw can also be used for rough cut-off and combination work on either table type or radial arm machines. Simonds "Easy-Cut" saws are made from 6" to 16" in diameter with 8 or 12 teeth to the saw, either solid tooth or carbide tipped.

Solid tooth "Easy-Cut" saws are for hand feed only. Carbide tipped "Easy-Cut" saws are recommended for either hand or power feed.

CARNER 3-IN-1 TWIST DRILL

According to its manufacturers, a really new twist drill has been put on the market by D. R. Carner Co., Inc., 106 Hospital St., Providence, R.I. The new tool is called the "Screw-Mate" because it matches the body shape of the corresponding size wood screw. This 3-in-1 drill will countersink, drill the shank clearance, and drill the tapered pilot hole all in one operation. The tapered pilot hole allows even the first threads of a wood screw to do their share of the holding.

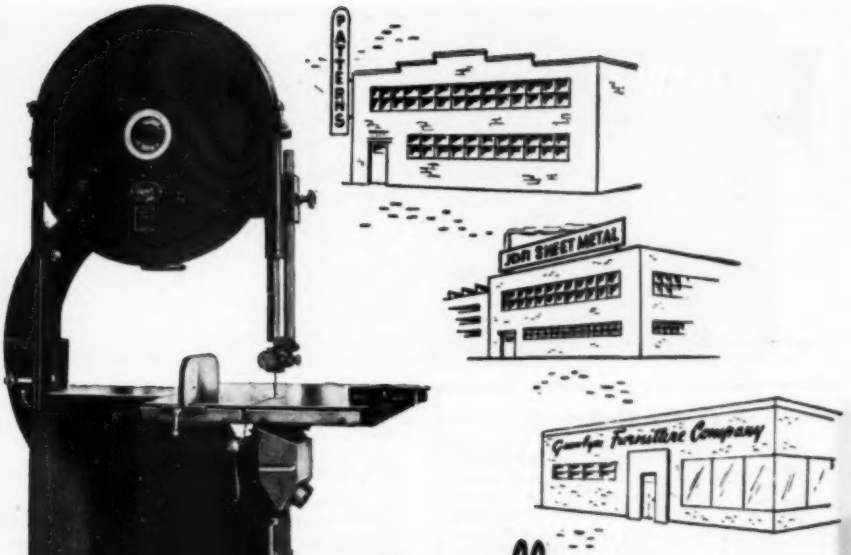
With a Screw-Mate drill it is impossible to drill the pilot hole too large or too small, too deep or too shallow. The shoulder on the tool stops the drill at just the right depth, while the size of the drill is slightly smaller than the body of the corresponding wood screw, providing a snug fit. The Screw-Mate fits any drill gun, hand drill or drill press, and is available in a wide variety of sizes. For manufacturers who counterbore and plug their fastenings, a Screw-Mate is available which counterbores, countersinks and drills tapered pilot hole in one operation.

All Screw-Mate drills are made from hardened and ground high-tungsten steel. Applications have been found wherever wood screws are used—in furniture and wooden box manufacturing, boat building, shipping departments, etc.

Mechanics Through The Ages

THE CATAPULTS USED BY THE ANCIENT ROMANS IN WAR WERE CAPABLE OF HURLING 57-POUND STONES MORE THAN 400 YARDS!
HUNTSMAN, 18th CENTURY ENGLISH CLOCKMAKER, DISCOVERED HOW TO MAKE CRUCIBLE STEEL WHILE SEARCHING FOR A BETTER TEMPERED STEEL FOR USE IN HIS WATCHSPRINGS!

AS LATE AS 1915, WOOD TURNERS WORKING IN THE ENGLISH CHILTERN HILLS PERFORMED THEIR WORK ON RECIPROCATING TYPE LATHES AS PRIMITIVE AS THOSE USED BY THE ANCIENT GREEKS.



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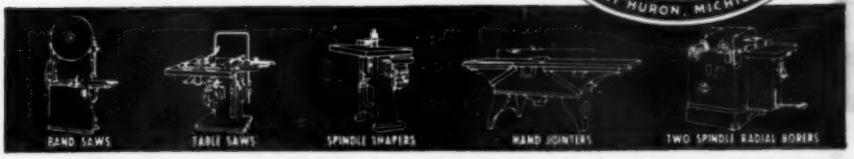
Moak High Speed Band Saws

FOR EFFECTIVE CUTTING OF A WIDE RANGE OF MATERIALS

A standard tool of woodworking shops, Moak High Speed Band Saws are proving their versatility in cutting such materials as pressed and plied boards, plastic laminates, corrugated paper, alloys, sheet metals and rolls of glass fibrous material. Functional design includes two-wheel equalized brakes for safety; "Lubricated for Life" bearings to cut maintenance costs. Wheel size is 36", available in three drives; also made with a 4-speed transmission.

Get the facts on Moak Band Saws right away. Write for our colorful booklet.

MOAK MACHINE & TOOL CO.
MOAK
PORT HURON, MICHIGAN



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DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.00; 2 inches $16.00; 3 inches (Maximum), $23.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill., making known your wants on either new or used machinery and the publisher will gladly assist you.

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THE "HART" LINE

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Earle Hart Woodworking Machine Co.
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Phone RAndolph 6-4970

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Band saw, 36" Crescent ball bearing Carter disc wheels, 3 HP direct motor drive
Glue Cooker, Black 8-gal. electric
Glue jointer, Jenkins No. 3CDA motorized
Lathe, 30" Imperial Auto. Turning, M.D.
Router, Onsrud W-240D, 5 HP two-speed
Sander, 54" Nash No. 77 2-Spl. auto. turning.
Sander, 43" Yates No. 401 3-dr. roll feed
Sawing, boring and chucking machine, Bell No. 24 Auto. double end.
Woodworker, Sidney Universal, five machines.

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P. O. Box 230 **Asheville, N. C.**

Air Compressors, various sizes
Bandsaw, Amer. 42" pb. bd.
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Band saws, Amer. B-36 36" bb. dmd.
Band saws, New Moak 36" bb. dmd.
Borers, McKnight No. 88 dmd.
Borer, Amer. 2 spindle radial dmd.
Borer, Root 2 spindle horiz. dmd. style "K"
Boring & sawing, McKnight 26F dmd.
Clamps, Handy No. 71 revolving
Clamps, Wysong & Miles case, air.
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Dovetailers, Dodds, 10-15 and 20 spindle
Dowel Driver & Gluer, Bell No. 8 dmd.
Glue jointer, F&E No. 429, bb. dmd.
Glue jointer, Jenkins No. 343A bb. dmd.
Hog, Mitts & Merrill No. 5 bd.
Jointer, Amer. 12" bb. dmd.
Jointers, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Moulder, Amer. 8" sq. hds. pb. bd. & motor
Moulder, Newman No 20—8" sq. hds. pb. bd.
Planer-Matcher, Yates A1-15"x6" rd. hds. pb. bd.
Planers, New Crescent 24" bb. dmd.
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type Hvy., duty, electric
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sander, Mattison No. 138—Belt, hand, pb. & motor
Sander, New Jefferson, hand block, bb. dmd.
Sander, Smith 49" 3 drum endless bed, bb. with mtrs.
Sanders, F & E 60" 3 drum roll feed, dmd.
Sander, Mattison No. 172 edge belt bb. dmd.
Sander, B & M 14 flat sander & motor
Sander, 48" double disc, dmd.
Sanders, McKnight sgl. drum 24"x16" dmd.
Sanders, Nash No. 25—10 spdle. dmd.
Saws, Famous, cutoff, bb. dmd.
Saws, Yates-Amer. G-7 straight line rip, bb. dmd.
Saws, DeWalt cutoffs
Saws, New Delta-Crescent 12" tilt. arbor, dmd.
Saws, Powers, gang rip, pb. v-belt & motor
Saws, Buss Tilt table Variety bb. dmd.
Saws, Yates G5 gang rip, pb. bd.
Shaper, Sherril Sgl. Spdle. bb. dmd.
Shaper, Defiance dbl. spdle., bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Taping machines, Dennis No. 2
Tenoners, Wilkins-Challoner No. 70, bb. bd. & mtr.
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Veneer Jointers, Jenkins Saw—6 ft. bd.
Woodworker, Crescent pb. bd.
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Band saw, Parks, 16 in., M.D., $75
Borer, Andrews, 20 in., 6 spdle., vertical, $350
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Clamp, American, 8x4 ft. Door, $250
Jointer, Oliver, heavy, 16 in., $225
Jointer, Fay, light, 16 in., $175
Mortiser, F&E, No. 379, ver. HC auto. hvy. duty, $400
Mortiser, New light HC, $100
Pony Planer, American, No. 1, 20x6, M.D., $375
Pony Planer, Trevor, 24x3, B.D., $250
Pony Planer, Parks, 12x4, B.B., $150
Ripsaw, Yates, G-2, st. line, self feed, $600
Ripsaw, Yates, G-2 st. line, $600
Sander, Boss, 30" two drum, $350
Saw, F & E, No. 291 double cutoff automatic, $750
Shaper, Delta, sgl. sp. BB MD, $185
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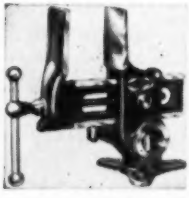

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50,000—Fir Plywood Discs—19½" Dia. x ¾" Thick
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1—Panel Fle, Taylor 66" x 15 complete with Glue Spreader, Cut Off Saw, and Steam Generator.
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1—Newman No. 600 Single Surfacer 24" BB DD with Grinder.
1—Double Surfacer, Whitney 30" BD with motors.
1—Boring Machine, Indiana No. 15-2.
1—Reynolds Screwdriver, power driven, hopper fd.

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Wood working plant, available for contract work. 6000 square feet.

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Also jointers from 12" to 30".
More than 150 machines to select from.

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Carload quantities baled wood shavings
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Yates American Mod. N4 Wood Shaper

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All above in excellent condition. Used only 2 years.

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MANAGEMENT OF BOTTOMLAND HARDWOODS

The Southern Forest Experiment Station has issued a bulletin on the management of bottomland hardwoods by John A. Putnam. About one-fifth of the South's total forest area is in bottomland types, yet no guide to the management of these lands has hitherto been available. The paper is written for the working land manager who must build up typically depleted stands as fast as possible and at the same time supply a mill with timber or provide an income for the land owner. The chief concern therefore, is to furnish the information needed to get management under way.

For readers unfamiliar with the bottomlands, the important types are described, the effect of site on type and the influence of hardwood utilization practices upon forest management.

Write for Paper 116 to the Southern Forest Experiment Station, Dept. WD, New Orleans, La.

"If it's for Woodworking . . . We Have It"

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American 20"
Crescent 20" Ball Br. New
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7" Blades, 40 hp motor.

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Greenlee Post Borer

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Hall & Brown No. 134 Comb. C. O. & Dado Saw, Power Feed

CUT OFF SAWS: Oliver No. 94-D St. Line C.O. Saw with Roller Tables 95% New
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Greenlee No. 456 Auto. Railway C.O. 12" cap.
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Swing Cut Off Saws (several)
Fay & Egan Table C. O. Saw

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16" American B.B. 4 knife Motor Dr.
Smith 16" 4 knife Jointer
Fay & Egan 20" rd. hd. Jointer
Fay & Egan No. 316 20" Rd. Hd. M.D.
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Fay & Egan 24" No. 115 Belt or Motor Dr.
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Wood Lathe Sets 12" to 24" swing
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Crescent Hollow Chisel Mortiser

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Hermance 10" 4 side
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Falls No. 103 St. Line B. B. 15 hp. motor
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Foley Band Saw Filer
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Oliver No. 80 D.M.D.
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Crescent No. 2, 3, and 5 Universal

SANDERS:
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Mattison No. 115 Variety Belt Sander
Wysong & Miles No. 171 Belt Sander
Yates Amer. Comb. 15" disc & Drum M.D.
Wysong & Miles No. 303 Comb. 26" Disc

SHAPERS
Crescent S-2 B.B. M.D.
Fay & Egan No. 265 Dbl.
Double Spindle B. B. Motors on spindle, 3600 or 7200 rpm

TENONERS
Crescent T-3 Electric Tenoner
Powermatic B. B. Tenoner

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Yates P-12/12"x20" 4 side

VENEER CLAMPS
5—38" 3 screws
4—29" 2 screws

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Andrews 6 spindles 8' Horiz. foot feed
Jones Superior radial, 1" to 16"
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Single spindle horizontal

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Dodds 10, 15, 20 spindle

JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday L. Powers, HB Smith, Crescent Sidney

LATHES

Mattison 55C BB Live Tailstock

MORTISERS

New Britain, No. 2, chain
New Britain, No. 7, chain
Northfield, chain mortiser, motor driven Hydraulic feed
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Mattison 229 8" All Electric
Vonnegut 6" DMD BB All Electric
Yates American No. C55—18" all electric
Yates American C55 9" DMD All Electric
SA Woods No. 107 12" 5 heads, belt driven
SA Woods No. 131 9", belt driven
American No. 20 7", belt driven
American C4A 8"x4" B.D.

PLANERS

American Saw Mill 24" single DMD BB
Buss No. 4 BB 30" single Sec Feed & Chip CMD knife Grinder
Northfield 24" single, MD motor fd. No. 5
American 24" single, belt drive
Smith 24" Facing Planer MD BB Power Fd.

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

SANDERS

Peerless 9" 14" and 20" horizontal
Peerless 9" 14" Vertical
Wysong & Miles, Oakley, Mattison belt
HB Smith 42" 3 drum, endless bed, MD BB No. 401
HB Smith 42" 3 drum endless Bed Plain Brg. belt drive

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Tannewitz 36" DMD 32" under guide
American No. 4 40" rip and resaw
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
Yates V40 48" BB Angle Bandsaw
Northfield BB & DMD 20" to 36"

SAWS - CUT OFF

Porter C43 5 HP DMD BB
Beach 5 HP DMD BB
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB
Beach multiple, cut off 6' DMD BB
Jenkins No. 105A double cut off and mitre saw, 96"x60" MD motor feed BB

SAWS - RIP SAWS

Sinker Davis, self feed gang, BB belt dr.
Mattison No. 207 BB MD Belt Feed
Hermance Straight Line Plain Bear., BD
Beach Self feed gang, DMD 15 HP BB

SAWS - VARIETY

American Saw Mill 5 HP DMD Tilt Arbor
American No. 10 tilt top belt drive
BM Root tilt top belt drive
Mereen Johnson, double tilt arbor, DMD BB with carriage
50 other makes to choose from

ROUTERS

Ekstrom Carlson Nos. 156 & 434
Onsrud W 240D

SHAPERS

L. Powers single BB - MD
Union Single spindle BB MMBD
Defiance Double spindle, DMD with tilting and sliding heads
Whitney 2 sp. automatic BB MD No. 105
Yates N2 BB MD

TENONERS

Crescent single end, 5 head individual motor drive, BB
Fay & Egan No. 70 Single end belt driven
American No. 1 Single end belt driven

MISCELLANEOUS

Electric Carpenter 5 machine combination all ball bearing motor driven.
NEW—Taylor caterpillar clamp carrier 60 sections, 6½' centers 32" wide clamps, air rotation.
Union case clamp.
American dowel machine BB
Covel Hanchett Band Re-saw grinder MD
Greenlee & Amer. Door clamps, Sash clamps
Morgan Double Lock Corner No. 8
Fay & Egan No. 470 Jigsaw

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McDonough 54" Ballbearing, Dir. Mtr. Dr. (new).

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Superior 36" Single, B.B., M.D.
Superior 42", ballbearing, motor driven
American No. B-36, 38", Ball bearing, Mtr. Dr.

BORERS
Andrews 60" 6-Spindle, Horiz., DMD Power Feed
Valley City, 2-spdl., adj. radial, motor driven
American 2-spdl., adj., radial, motor driven
Superior 2 Spindle Adjustable Radial, BB, D.M.D.
Superior 3-Spdle., Adjust. Horiz. Motor Driven
Wysong & Miles No. 283B, Sgl. Spdl. Vert., B.B. D.M.D. (Like New)

CLAMPS—ASSEMBLY
Bell Chair Assembly, Air Operated (like new)
Bell 4-way Hi-Jaw, Air Operated.
Bell 4-way Frame & Chair Back, Air Operated.
Bell No. 95, Revolving Case Clamp, Air Operated.

CLAMP CARRIERS
Handy 18-sec., 5 ft. wide, 38" clamps per sec.
Taylor 12-Section, 6½' wide, 32" clamps per sec.

DOVETAILERS
Dodds 25 Spindle, motor driven, spiral gears.

DOWEL MACHINERY
Bell No. 4-A capacity ¼"-2", M.D., B.B.
Bell No. 8 Auto. Gluer & Dowel Dr., Dir. M.D.
Hawker No. 2, capacity ¼" to 2", B.B., M.D.
Nash No. 4 Dowel Rod Sander, motor driven

FACERS—JOINTER FEEDERS
Porter Herzog 30", Ballbearing, Round Hd., DMD
American 24" Ballbearing, Round Head, Motor Driven, with Billstrom Feeder

JOINTERS
Fay & Egan No. 217, Continuous Chain Feed
Jenkins No. 3CD, Cont. Chain Feed, BB., D.M.D.
American 12", Round Head, motor driven

JIG SAWS
American, self-ecntained
Oliver No. 173 Self-contained, D.M.D.
Superior, Self-contained, motor driven

MORTISERS
Greenlee No. 228 Vert., Hollow Chisel, M.D.

MOULDERS
American No. 1, 4", 4-Side, Motor Driven
American No. 1, 6", 4-Side, Motor Driven
American No. 35, 7", 4-Side, All Electric, B.B.
Mattison No. 262, 6", 4-Side All Electric B.B.

PLANERS
Superior 28" Single, Motor Driven
Buss 4-L, 30" Single Cabinet, b.b., d.m.d.
Buss No. 4, 30" sgl. cabinet, M.D.
American No. 112, 30" single, motor driven

ROUTERS
Porter No. 502, 2-spdl., B.B., D.M.D.
Porter No. 600 High Speed, Ballbearing, DMD

SANDERS
American No. 2, 24" Disc and Oscillating Spdl.
American No. 5 Drum Sander, D.M.D.
Ekstrom Carlson No. 23 Scroll Sander, BB, DMD
Ekstrom Carlson No. 18 Double End Pneumatic Drum, B.B., D.M.D.
Fay & Egan Hand Block Belt, Motor Driven
Indiana No. 12 Edge Belt, Ballbearing, D.M.D.
Mattison No. 138 Hand Block Belt, Motor Driven
Mattison No. 172, Oscillating Edge Belt, Mtr. Dr.
Pryibil 20" Horizontal Belt, Motor Driven
Pearson Model A Universal Edge Moulding Sander, B.B., D.M.D.
Yates No. 430, Hand Block Belt, Motor Driven

SHAPERS
Onsrud W125 72" Automatic, multiple stations, B.B., direct motor driven, with frequency changer
Buss, Sgl. Spdl., Hi-Speed D.M.D., B.B.

SAWS—CUT-OFF
Bell No. 12-B Dbl. Mitre and Cut-Off, BB, DMD
Buss Double End, Motor Driven
Diehl No. 724, Floor Type, Str. Line, BB, DMD
Racine Floor Type—motor driven
Fay & Egan Double End, Motor Driven.
Irvington No. 20, Floor Type, Str. Line, BB, DMD
Oliver No. 136 Ceiling Type Swing, BB, DMD, with Tables.
Yates-American, Floor Type, B.B., D.M.D.

SAWS—RIP
American No. 15 Chain Feed, motor driven
American No. 40 Chain Feed, Ballbearing, D.M.D.
Defiance No. 21-D Chain Feed—motor driven
Diehl No. 75, Straight Line, Chain Feed, Ball bearing, Direct Motor Driven
Mattison No. 207 Chain Feed, Ballbearing, DMD

SAWS—VARIETY
American No. 1, Tilting Table, Motor Driven
Dodds Tilting Table, Motor Driven
Pettingell, Tilt Arbor, Roller Table, M.D.

SHAPERS
Whitney No. 393 Automatic, Single Spindle, BB, DMD, with Frequency Changer

TENONERS
American, Single End, Tenon Heads, M.D.
McKnight No. 71C Chair Back Tenoner, M.D.
Towsley Single End, Tenon heads, lower cope, cut off saw, motor driven

VENEER MACHINERY
Black Bros. No. 115 36"x84" Electric Press, Direct Motor Driven driven
Dennis Continuous Feed Veneer Jointer, M.D.
Dennis Veneer Taping Machine Motor Driven
Jenkins-Falls Veneer Jointer, B.B., motor driven

MISCELLANEOUS
Autonailer, Floor Type, Direct Motor Driven, B.B.
Bell No. 13 Dovetail Gluer.
Bell No. 56 Hand Feed Chucking Machine, Ballbearing Direct Motor Driven
Black No. 5, 12" Edge Glue Spreader, Electrically Heated, Direct Motor Driven
Fay & Egan No. 253, Auto. Knife Grinder, 30".
Sturtevant 60" Exhaust Fan, Motor Driven
Sturdevant 60" Exhaust Fan, Motor Driven

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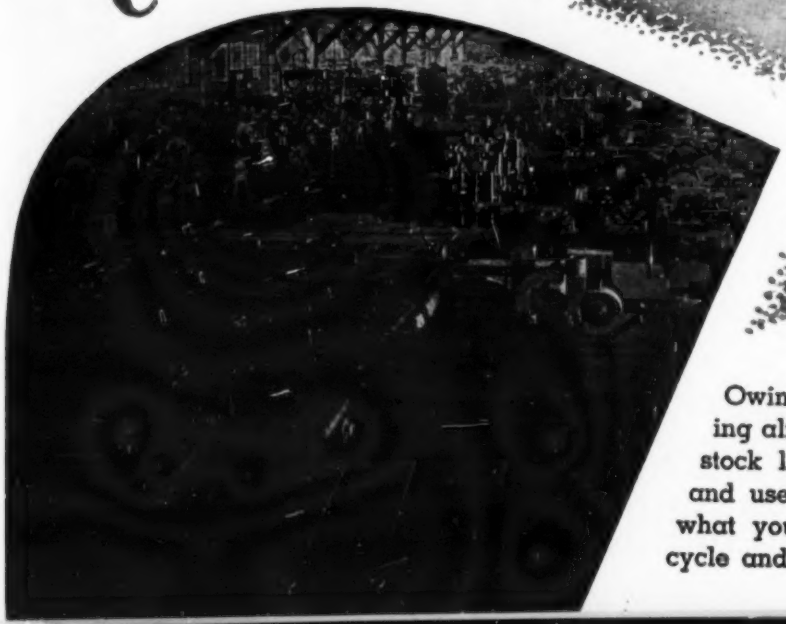

At Left, a partial view of our warehouse looking toward the rear, showing only about one-third of our stock.

Owing to our very large stock changing almost daily, we are omitting our stock list. We have about 350 new and used machines. Tell us exactly what you want, and advise phase, cycle and voltage of your current.

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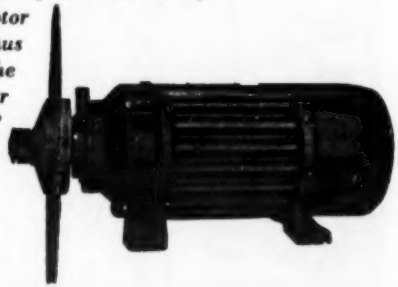

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Single Spindle Fay & Egan No. 1 Vert. Borer
Multiple Spindle Vertical Fay & Egan Borer
Root Vertical Hydraulic Gang Borer
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Practically New Taylor 40 Section Power Operated Clamp Carrier
Taylor 40 Section Air Operated Clamp Carrier
Handy No. 103 Frame Clamp
Automatic Edge Gluer with Taylor Panel Flow Glue Spreader
29 Section 6½' Power Operated Billstrom Clamp Carrier

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Dodds 15-Spindle Dovetailer
Dodds 12-Spindle Dovetailer
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Wysong & Miles No. 290 Auto. Dovetailing Mach.

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Practically New Black Bros. 12" Motor Driven Edge Glue Spreader
New Union Conveyorized Edge Glue Spreader
Taylor Panel Flow Edge Glue Spreader

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American No. 9 Automatic Knife Grinder
New Hanchett Automatic Band Saw Grinder for 7" Blades

JOINTERS

Yates-American No. 213 Direct Motor Driven Glue Jointer
12" direct motor driven ball bearing Hand Jointer

LATHES

Mattison 42" No. 57-D motor drive ball bearing
Mattison 30" No. 55-C motor drive ball bearing
Large quantity Mattison Lathe Heads with carriers and knives

MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
Greenlee No. 227 direct motor driven single spindle mortiser

MOULDERS

Yates-American 4" Type C-69 Electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Mattison 6" No. 276 Electric Moulder
Yates 10" Type C-55 Electric Moulder
Practically New 12" Vonnegut Electric Moulder

SINGLE PLANERS

New Crescent P-24 Direct Motor Dr. with Grinder
Used Crescent P-24 Direct Motor Driven
Whitney Ball Bearing Direct Motor Driven
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Herzog Feed

DOUBLE PLANERS

Yates-American 30" No. 177 Ball Bearing Direct Motor Driven with electric Knife Grinder

SANDERS

Solem 43" S-3M Motor Driven Ball Bearing Endless Bed Sander
Yates-American 43" No. 431 Direct Motor Driven Endless Bed Sander
Yates-American 61" S-23 Roll Feed Direct Motor Driven Ball Bearing Three Drum Sander
Mattison No. 124 Automatic Stroke Sander
Pearson Waterfall Sander
Nash No. 10 Automatic Turning Sander
Oakley Semi-Automatic Stroke Sander

BAND RESAWS

Yates No. 283 Roller Bearing Band Resaw
American No. 4 Band Resaw
Mershon Practically new 54" No. 54C Ball Bearing Motor Drive

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Yates-American No. 2 Direct Motor Driven Ball Bearing Double Cut-Off Saw
Beach Direct Motor Driven Ball Bearing Double Cut-Off Saw

RIP SAWS

Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
Yates-American G-7 Direct Motor Driven Ball Bearing Chain Feed Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw

ROUTERS

Porter No. 600 Electric Router

MITRE SAWS

Yates Type F-2 Direct Motor Driven Ball Bearing
Tannewitz Direct Motor Driven Tilting Table Variety Saw
Bell No. 12 Direct Motor Driven Ball Bearing Double Miter Saw

SHAPERS

New Crescent Type S-2 Single Spindle Shaper
Whitney No. 139 Double Spindle Electric Shaper
Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 393 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper

TENONERS

Fay & Egan No. 505 Direct Motor Driven Ball Bearing Single End

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Francis 96" by 36" Hydraulic Veneer Press with 100 pairs of clamps and irons
Francis 76" Hyd-aulic Veneer Clipper
Dennis Veneer Taping Machine, Motor Driven
Diehl No. 69 Veneer Jointer Direct Motor Driven
Merritt 8 and 10 plate redriers 84" by 54"

MISCELLANEOUS

GE 15 KW Motor Driven Frequency Changer
Leitelt Lumber Lift
Porter No. 3MB Pedestal Type Spindle Carver Motor Driven Ball Bearing

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Hand Jointers | **Mitre Saws** | **Self-Feed Rip Saw**
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Multiplex Saws and Delta Machines

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Tannewitz-Greenlee-American-Crescent-Meak 36" BB M.D.
Yates-American 36" BB M.D.
Buss 36" bab-brg., V-belt, motor-drive.
American 42" V-belt, motor drive.
Tannewitz 42" M.D.

BAND RIP AND RESAW
Yates No. 312 44" chain-feed hand rip.
McDonough 62" Vertical Band Resaw.
Mershon 46" Twin Band Rip B.B.

BORING MACHINES
Rogers Single Spindle Horizontal Borer
New Wysong & Miles, sgl. spdl. vert. d.m.d.
Greenlee 6-ft. No. 370 Hor. gang, M.D.
Greenlee 36-in. No. 369 vert. gang, 8-spd m.d.
Greenlee 363-6 spindle, Univ. Vertical M.D.
Root "B-M" 16-spindle, cluster hd. motor dr.

BLOWERS AND FANS
American No. 80E with 40 h.p. coupled motor.

CLAMPS—GLUE ROOM EQUIPMENT
Taylor 6-ft. 12 sec. wheel type clamp carrier.
Black Bros. 10" 50-sec. power feed.
Greenlee No. 599 frame and furniture clamp.
Buss Drawer Clamp 24"x12" jaws.

FILING ROOM MACHINERY
Hanchett band saw brazer.
Rogers 38" cup wheel auto. knife grinder.
Hanchett No. 608 lap gr. b.d. max. cap. 8" wide
Covel-Hanchett No. 325 thin knife grinder.

JIG SAWS
Smith-Colladay-Jones Superior M.D.
Porter 6" V-belt motor drive.
Mattison Greenlee D-618 continuous feed.

JOINTERS
Yates No. 213 Continuous feed direct m.d.
Meyers continuous feed V-belt M.D.
Porter, American, Oliver, Sidney, Fay & Egan, from 8" to 30" wide—several have feeding attachments—tell us what you need.
Yates and Diehl cont. feed glue jointers, M.D.

LATHES
Mattison No. 55-F 30-in. auto. shaping, M.D.
Whitney 50-in. backnife, gage, lathe.
Mattison No. 214 copying lathe.
50" Mattison hexagon T-slot heds with carriers and knives 2 11/16" bore.
Yates-American T5 Auto. Shaping, M.D.

MORTISERS
Greenlee No. 226 Hollow Chisel, belt drive.
New Britain Nos. 2 and 7 chain, motor drive.

MOULDERS
Yates No. C3 4" fast feed, belt drive.
Yates No. 108 9" belt drive coupled motor.
Rowley-Hermance, 6-in. coupled motor drive.
Newman 4"x4" all Electric.
Yates No. C-89 10"x4" all Electric.
Vonnegut 12"x4" with Freq. Changer.

PLANERS
Yates No. 156 20" dr. hd. m.d.
F. & E. No. 156 24-in single, V-belt, m.d.
Buss No. 4A 36-in. 4-roll single, dir. m.d.
Buss 6A 36" 6-roll single, D.M.D.
Yates B2 36" double M.D.

ROUTERS
Carter Type TR-Porter No. 600-Ekstrom-Carlson
Porter No. 622 Vertical Ball Brg. M.D.

SHAPERS
Onsrud W 125 Automatic 84" cap.
Whitney No. 134 double-spindle dir. M.D.
Amer. No. 20 dbl-spdl. dir. M.D. Freq. Chgr.
Advance double-spindle, ball bearing, mtr. dr.
American dbl. spindle, belted m.d.
Onsrud W-248 single, ball bearing, m.d.
Whitney No. 282 Sgl. D.M.D. 56"x40" table

SANDERS
Yates 401-49" roll feed, M.D.
Solem No. 370 43" 2 drum End, Bed.
Smith No. 400 49" 3 drum End, Bed.
Mattison No. 124, 6-ft. auto. stroke, m.d.
Yates No 413 42" 2-drum, End Bed M.D.
Buss 2-spindle vertical, oscillating belt drive.
Wysong & Miles No. 164 universal belt, m.d.
Yates No. 421, 49-in. 6 drum with motors.

MITRE SAWS
American No. 1 tilt table V-Belt M.D.
Union Tilting Arbor direct M.D.
Tannewitz tilt table motor on arbor.
Wallace 8" tilting arbor 1 HP 1 ph. motor.
Crescent No. 10 roller tilt-table direct m.d.
American Dbl. revolving Arbor 5 HP Belted mtr.
Whitney No. 77 tilting arbor, direct m.d.

CUT-OFF SAWS
De Walt Radial Arm, 5 HP motor.
Multiplex A50 Radial Arm, 2 HP.
Jenkins No. 97, 108"x48" Double End chain feed with copes, direct M.D.
Fay & Egan, No. 306 butting saw.
Greenlee No. 451 auto. cut-off and dado.
Buss double cabinet type, motor drive.
Porter 43-208 36-in. stroke, motor on arbor.
Oliver No. 94 straight line, direct mtr.-dr.

RIP SAWS
Yates G-2 Chain Feed Motor Drive.
Yates G-77 Chain Feed, D.M.D.
Smith No. 335-A self-feed, belt or motor drive.
Mattison No. 207 Chain Feed, Motor Drive.
Diehl No. 75 Chain Feed, Direct Motor Drive.

TENONERS
Greenlee 535 Saw Tenoner, dir. M.D.
Greenlee No. 534, Single End with cut-off, no copes, dir. m.d.
Smith No. 225-CE Single-End with copes.
Jenkins No. 95 double end, jump dado, d.m.d.

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American B-36, 36"
Oliver No. 116, 36" D.M.D.
Jones-Superior No. 155, 42" M.D.
BAND RESAW
Fay & Egan No. 280, B.M., M.D.
BORERS
Root "GM" Vertical Single Sp.
Greenlee No. 368 2-Sp. Horiz. M.D.
Keystone 3-Sp. Horiz. 1" centers
CLAMPS
Lancaster No. 400-B Air Frame Clamp
Lancaster No. 500 Air End Clamp
CLAMP CARRIERS
Taylor 6½ Ft. 12-Sec. Wheel Type
Taylor 7½ Ft. 40-Sec. Chain Type
DOVETAILERS
Dodds 10 & 12 Sp., spiral gear
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Black 30-Gal. Cold Resin Glue Mixer
Bell 72" Plate Edge Gluer
JOINTERS
6", 8", 12", 16", 20" sizes
30" with Billstrom Feeding Attach.
Yates Continuous Feed Glue Jointer
LATHES
Mattison No. 57-D 42" Automatic
Reed 16" Turning Lathe, 16" Swing
MORTISERS
Crescent Vert. M.D. Hollow Chisel
Wysong & Miles No. 181, 6-Spindle
American No. 10 Sash Mortiser & Relisher
MOULDERS
Hermance 6" 4-Side
American 8" 4-Side
4" & 6" Single Head Stickers
PLANERS
24", 30" and 36" Single
SANDERS
Nash No. 65 Automatic Turning
Wysong & Miles 16" Disc Sander
Curtis No. 11 Semi-Auto. Belt Sander
Porter-Cable B-6 Irregular Belt
American No. 2, 43" Roll Feed 3-Drum
SAWS—CUT-OFF
Porter Floor Type, with table
Y-A C-44 Floor Type, with table
Root No. 248 Double, 32"x82"
Bell No. 12 Double Miter
SAWS—CHAIN FEED
Mattison No. 204 and No. 207
American No. 15 Ball Berg., M.D.
SAWS—SELF FEED
Root and American
Hermance No. 31 Adjustable Roll
Greenlee No. 426—Yates No. 257
SAW TABLES
Tannewitz SJ Tilting Arbor
American Dbl. Reval. Arbor
American No. 7½ Comb. & Dado
SHAPERS
Whitney No. 8 Double Spindle
American No. 1 Single Reversible
Shimer Single Sp. Reversible
TENONERS
Fay & Egan Single End
American & Smith Single End
VENEER JOINTER
Jenkins No. 23 D.M.D. Ball Berg.

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Greenlee No. 212-M BB Gang H.C. Mortiser
Hermance No. 50—10" Ball Bearing Belt Drive Moulder
Mattison No. 226—12" Ball Bearing Electric Moulder
Mattison No. 231 Pedestal Knife Grinder
Wilkin-Challoner 78"x34" BB Belt Drive Dble. End Tenoner w/motor
Hayes 96"x40" Pl. Bearing Belt Drive Dble. End Tenoner w/15 H.P. mtr.
Jenkins No. 96 Ball Bearing Belt Drive Double End Tenoner
Ekstrom-Carlson No. 448 M.D., BB Vert. Gang Borer, 48"x22" range
Yates S-7—6' Hand Lever Stroke Sander
Mattison No. 115 Variety Sander
Jones Superior No. 145—30" Disc Sander
Wilkin-Challoner 72"x40" Electric Ball Bearing Dble. Cut-Off Saw
Greenlee No. 495 BB Variety Saw
Crescent Dowel Machine with 5 H.P. Motor
Hall and Brown Dble. Spdle. Shaper
Greenlee No. 110—36" BB, DMD Single Planer
Whitney No. 24—30" Motor Driven Ball Bearing Dble. Planer
American 30" Ball Bearing Facer with Herzog Feeding Attachment
Porter No. 300-CM—24" Facer with Herzog Feeder
Moak 12" Motor Driven Ball Bearing Hand Jointer with 3 H.P. Motor
Mattison No. 244 BB Cut-Off Saw
Billstrom 29 Section Clamp Carrier, Hand Operated
Billstrom 29 Section Clamp Carrier, Motor Driven

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Andrew 48" & 72" Mult. Horiz. Borer
* Wysong & Miles No. 283-B Vert. Sgl. Spl. Borer.
* Greenlee No. 369—48" Vert. Mult. Borer.
Andrews 60" multiple vertical borer.

CHAIR MACHINERY
* McKnight double end sawing and boring machine.
* McKnight 4CM horiz. and vert. borer with double end sawing.
McKnight No. 1E saddle seat machine.
Bell No. 8 dowel gluer and driver
Dauber-Bell dowel cutter and pointer.
Nash chair seat angular borer.

CLAMPING MACHINERY
Taylor 40 Section 75" Revolving Clamp Carrier.
Taylor 12-section glue wheel—high jaws
Handy No. 447 Air Operated, 2-Way End Clamp.
Lancaster 100C air-operated 2-way frame clamp.

GLUE MIXERS & SPREADERS
Francis M-7 (75 gallons) Veg. Glue Mixer.
Union 36" and 60" Dbl. Roll Resin Glue Spreaders.

JOINTERS
* Porter style C—16" hand jointer.
* Fay & Egan No. 506—12" hand jointer.
* Yates-American No. 213 Glue Jointer.
* Machinery Methods D-616 glue jointer.

LATHES
* Mattison No. 55-C Auto. Turning Lathe, B.B.

MORTISERS
Greenlee No. 228 Auto. Hollow Chisel Mortiser.
New Britain No. 7 chain saw mortiser.
Wysong & Miles No. 268 horiz. mult. hollow chisel mortiser.

MOULDERS
* Yates C-55—9" electric moulder.
Yates C3A-4" BB Belt Drive Moulder
Hermance No. 50—8"—10"—12" drop bed moulders.

PLANERS—Facing
* Buss No. 4—26" single planer.
* Whitney No. 32—30" single planer.
* Porter 24" facing planer—Herzog feed.

PLANERS
* Greenlee No. 110—30" 6-roll single planer.
* Whitney No. 24 30" Double Planer.
* Whitney No. 33—40" Heavy Duty Dbl. Planer.
* Yates B-2 36" double planer.
Berlin No. 177—30" roughing planer.

PLANERS & MATCHERS
Newman No. 512—16" planer and matcher b.b.
Fay & Egan No. 666—15" planer and matcher, b.b.
Triumph 24" Planer, Matcher, Moulder, B.B.

ROUTERS
Onsrud W-240 heavy duty electric router.
Porter No. 600 and 610 heavy duty elec. router.
Onsrud W-265 Electric Router.
* Onsrud A4D single arm radial router.

DRUM SANDERS
* Smith No. 404A—31" 3-drum endless bed sander.
* Solem SE74—49" 4-drum endless bed sander.
Yates No. 431—31"—43"—67" 3-Dr. End. Bed Mtrzd.
* Solem S-3-M—73" 3-Drum Endless Bed Sander.
American No. 9—61" 3-drum roll feed sander, mtrzd.

SANDERS—Belt & Miscellaneous
* Wysong & Miles No. 603 Automatic hydraulic stroke
Mattison No. 124 Auto. Stroke Sander.
Yates 430 hand block belt sander.
* Ekstrom-Carlson No. 18 Pneumatic drum Sander.
Nash No. 10 & No. 25 Auto. Spindle Sanders.

SAWS—Band Scroll & Resaws
* NEW Crescent 20" Band Scroll Saws.
* American B-36" band saw.
* Fay & Egan No. 50—36" band saw.
Mershon 54" vertical band resaw.
* McDonough 44" vertical band resaw.

SAWS—Cut-Off
* Porter 43-208 straght line cut-off saw.
* Bell No. 216 straight line cut-off saw.
* Yates-American No. 5 Swing Saw.
* Jenkins No. 105-A Dbl. Cut-Off and Mitre Saws.

SAWS—Rip
* Yates-American Type G-67 Straight Line Ripsaw.
* Mattison No. 202 straight line ripsaw.
Berlin No. 257 self-feed ripsaw.
Greenlee No. 426 self-feed ripsaw.

SASH & DOOR MACHINES
* Bell No. 11 power dorr clamp.
Greenlee No. 602 sash clamp.
Bell No. 7 dowel driver and gluer.

VARIETY SAWS
* Fay & Egan No. 500 tilt-table variety saw.
* Yates-American No. 1 Tilt Table Variety Saw.
* Tannewitz tilt-table variety saw, b.b.
Baker Double Arbor Variety Saw, BB.

SHAPERS
* NEW Crescent No. S-2 Single Spindle Shaper.
* Poter No. 103 Single Spindle Shaper
* Porter No. 201 Double Spindle Shaper
* Greenlee No. 180 Double Spindle Shaper.
* Whitney No. 351 double spindle, 12½ HP motors
* Whitney No. 393 **Automatic** Single Spindle Shaper.
* Onsrud No. 124 **automatic** single spindle shaper.
* Whitney No. 395 **automatic** double spindle shaper.

TENONERS
Greenlee No. 530 single end tenoner.
H. B. Smith Single End Tenoner.
Wilkin-Challoner No. 80 Double End Tenoner. BB
* Wilkin-Challoner No. 70 - 84" double end tenoner.

VENEER EQUIPMENT
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Merritt 84x54—8—10—12 Plate Redriers.
Plycor (Fritz) Tapeless Splicer.
Handy 30"x96" hand screw veneer press.

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Food Machinery Co. Model AC-2 boxmaker.
* Woods No. 227 side head grinder.
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Clamps: R. & H. door; Greenlee sash.
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Dovetailer, Dodds, 15-spindle.
Dowel Gluer and Driver Bell No. 8, mtr.
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Hogs: Diamond No. 25; M. & M. No. 15CE.
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Jointer, incline bed, Newman No. 60, 16", 5 h.p. motor on cylinder.
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Moulder, electric, Eaglesfield 12", ballb.
Moulder, 4-side, Smith 6", ballb., mtr.
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Sander, 3-dr., Berlin 30", 4-motors.
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Sander, Belt 8' Schimmel Reid Semi Auto.
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Mattison No. 244 Cut Off Saw, B.B, D.M.D.
Hermance No. 36 Chain Feed Rip Saw, D.M.D.
Mattison No. 207 Chain Feed Rip Saw, B.B., D.M.D.
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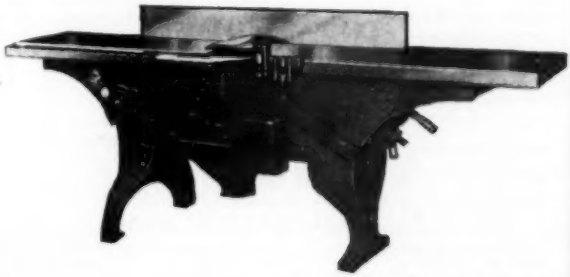

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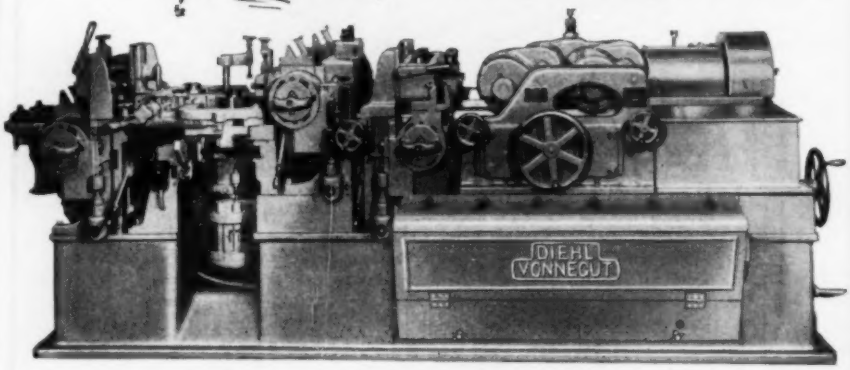

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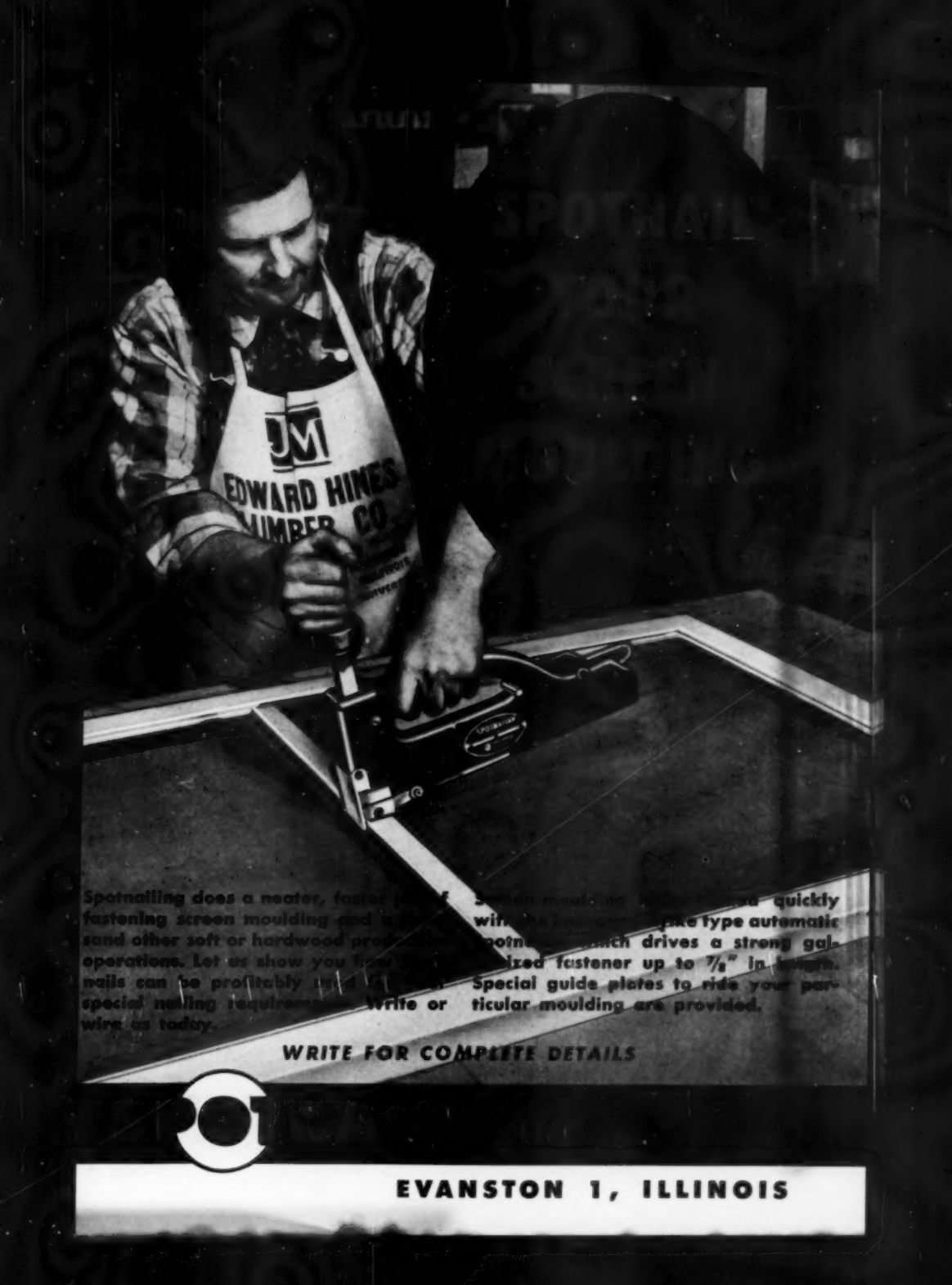

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